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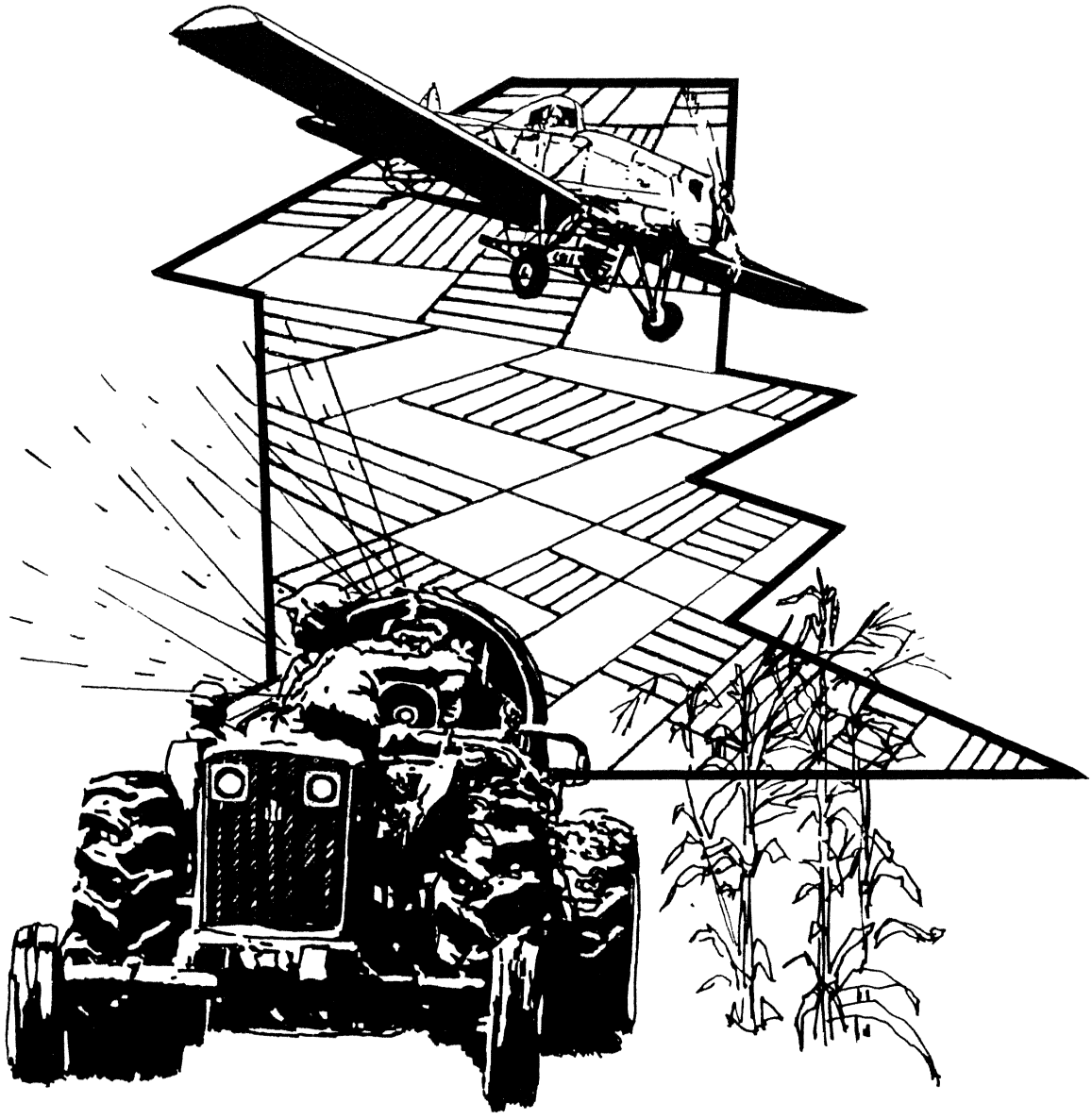
PESTICIDE USE ON MAJOR FIELD CROPS IN OHIO - 1982



OSU Cooperative Extension Service
The Ohio State University

PESTICIDE USE ON MAJOR FIELD CROPS IN OHIO - 1982

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* - Deceased near completion of compilation of data.
This publication is dedicated to his remembrance.

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Acie C. Waldron, Mark A. Evans and Homer L. Carter

FIELD CROP PESTICIDE USE SUMMARY

Herbicides

Major field crops in Ohio treated with herbicides in 1982 totalled 8.5 million acres which constituted 62% of the total major field crops and pasture acreage. Herbicides were used for weed control on 99% of the corn and soybean acreage, 74% of the tobacco acreage and 31% of the oats acreage and considerably lesser percentages of the acreages of other crops. Alachlor and atrazine were the two major herbicides applied. A total of 6.9 million pounds of alachlor active ingredient (a.i.) was applied to 1.6 million acres of corn and 1.8 million acres of soybeans. A total of 5.3 million pounds of atrazine a.i. was applied to 3.5 million acres of corn. Metolachlor was the herbicide ranking third in quantity used with approximately 2.5 million pounds used on 1.24 million acres of corn and 2.0 million pounds on 1.0 million acres of soybeans. Approximately 2.0 million pounds of cyanazine and 1.9 million pounds of butylate were used on 1.2 and 0.52 million acres of corn, respectively. Approximately 1.0 million pounds of chloramben, 1.0 millon pounds of metribuzin and 0.8 million pounds of linuron were used on approximately 0.64, 2.0 and 1.0 million acres of soybeans, respectively. The major weed problems reported were general broadleaf and grass, the foxtails, Canada thistle, the ragweeds and fall panicum.

Insecticides

Insecticides were applied to 2.2 million acres or 16% of the major field crop acreage. Approximately 43% of the corn, 42% of the alfalfa hay and 51% of the tobacco acreages were treated. Approximately 676,000 pounds a.i. of fonophos, 672,000 pounds of terburfos and 548,000 pounds of carbofuran were applied to 583,000, 498,000 and 485,000 acres of corn, respectively, for the control mainly of corn rootworm.

Approximately 93,500 pounds of carbaryl and 17,600 pounds of diazinon were applied to 86,600 and 11,200 acres, respectively, of soybeans mostly for Mexican bean beetle and leaf bean beetle control. The major insecticides used on alfalfa for control of potato leafhopper and alfalfa weevil were 42,200 pounds of carbaryl on 47,400 acres and 52,500 pounds of dimethoate on 124,900 acres. The quantities of insecticide use on other crops were relatively small compared to the above crops.

Disease and Other Control

Approximately 2.5% of the major field crop planted acreage was treated with fungicides or other controls. Captan was the fungicide most commonly used, being applied to 77% of the fungicide treated acreage with approximately 68% of that used for corn. Approximately 50% of the tobacco acreage was treated with maleic hydrazide and metalaxyl.

Applicator

Approximately 82% of the acreage receiving herbicides was treated by farmers who applied 81% of the total herbicide poundage. Farmers applied 94% of the insecticides to 93% of the acreage. The majority of the fungicides were also applied by the farmer. Over 72% of the farmers were certified pesticide applicators.

Method of Application

Of the acreage treated with herbicides, 68% was ground-surface applied, 31% was ground-incorporated and 1% was aerial applied. For insecticides, 97% was ground-surface applied, 2% aerial and 1% ground incorporated.

Method of Land Preparation

Conventional land tillage practices prevailed for 67.4% of the major field crop acreage in Ohio in 1982 followed by 27.2% for minimum tillage and 5.4% no-tillage. The largest percentage of no-till acreage was 9.8% for corn. Minimum tillage for corn and oats was approximately 30% each, for wheat-35% and soybeans-21%. Approximately 16% of the farmers used integrated pest management practices in their operation with almost 38% of that service provided by the pesticide dealers, 31% by the Cooperative Extension Service and 23% by commercial consulting services. Ninety-six percent of the farmers used chemical pest control practices but 88%, 78% and 68% also used crop rotation, resistant varieties and cultivation practices, respectively, in their pest control program.

District Data

Responses to the survey were prepared for the nine regions in Ohio as well as for the state as a whole. Counties within these regions have similar climate, topography and soil types. By ensuring that the population sample response was adequate from each region, tabulation of data provides that the results from each region are valid and can stand alone as representative of that region, if so desired. The data provide analyses of cropping practices and pesticide use in relation to specific areas of the state and comparisons with other areas, as well as contributing to the state totals.

PESTICIDE USE ON MAJOR FIELD CROPS IN OHIO - 1982

INTRODUCTION

Pesticide Use Surveys for agricultural crops were initiated for the first time in Ohio in 1978. The major purpose was to provide factual data regarding the critical and essential needs of pesticides as related to the use and the benefits/risks evaluation of the Environmental Protection Agency (EPA) registration/reregistration program. Organized pesticide use surveys were designed to replace the practice of making rough estimates that were consistently requested by regulatory and other agencies. During the interim from 1978 to 1982 pesticide use surveys were conducted and published for commmercial sales, "restricted use" pesticide sales, major crops, fresh market vegetable crops, greenhouse vegetable crops, greenhouse floral crops, nursery crops, golf courses and turf, deciduous tree fruit crops, processing vegetable crops, livestock and poultry and stored grains.

Information needs associated with the risk/benefit analysis of pesticides in EPA's registration/reregistration process requires that use data be as factual as possible and related to the current agricultural practices. It has been suggested by state and federal clientele that where possible pesticide use surveys be repeated at relatively regular 3 to 5 year intervals. This publication is thus partially in response to the requests from Cooperative Extension Service and research personnel, clients of the Ohio Crop Reporting Service, private industrial concerns and state and federal governmental agencies for updating the information on pesticide use. It will provide comparison with the data of the 1978 survey and also that obtained by other agencies through different enumeration methods. It also provides information on trends in pesticide use for major crops in Ohio.

PROCEDURES

The sample for the 1982 Ohio Major Field Crop Pesticide Use Survey was drawn from the lists of farm operators maintained by the Ohio Crop Reporting Service (OCRS) and lists of certified private pesticide applicators on file with the Ohio Department of Agriculture (ODA). All sizes of farm operators were included with the number selected for each of the nine regions proportioned to the number of farms and the clientele response in that region. In some cases, a second mailing was required in order to get a proportionally representative sample from each region.

The sampling for tobacco producers concentrated on the particular growing areas in the state for that crop and involved a larger percentage of the total of such growers than producers of other major crops because of a much smaller available sample population. Sugar beets were not produced in Ohio in 1982 due to the closing of the sugar factory for that year and, consequently, no contracts between producers and processors.

The questionnaire was modified from that used for the 1978 survey in order to avoid some of the problems encountered previously and to obtain additional information. Also, a new computer program was written by OCRS to handle the survey data and remove the complications and difficulties that they encountered in the program developed by other states for the 1978 North Central regional survey program. The questionnaire, including listings of crop pest problems and pesticides common to Ohio agriculture, (Appendix I), was mailed to 12,686 farmers in Ohio in early March 1983. A second questionnaire, (Appendix 2), related to pesticide use practices, was mailed in late May 1983 to 2,299 of those who responded to the earlier questionnaire.

RESULTS AND DISCUSSION

A. General

Approximately 29% (3,623) of the Ohio farmers sampled in the first phase of the survey and 66% (1,516) of those in the latter phase responded with usable data. These acceptable returns accounted for data on approximately 9.8% of the corn acreage in the state, 8.6% of the soybeans, 6.8% of the wheat, 7.1% of the oats, 7.6% of the alfalfa hay, 3.9% of the other hay, 2.2% of the pasture and 4.0% of the tobacco acreage which were considered very representative of region and state totals, (Tables 1 and 2). The data in the second phase of the survey were also considered representative for the state.

Of the 13,694,400 acres of major crops planted in Ohio in 1982, (Table 3), pesticides were applied to 62.1% for weed control, 16.3% for insect control and 2.5% for disease and other control. This constitutes increases of 5.5% in the planted acreage treated with herbicides, 0.2% for insecticides and 1.2% for fungicides in comparison to the data for 1978. /1/ The data for each crop in 1982 reflecting state totals are recorded in Table 3 and the tabulations for each region in the state, (Fig. 1), are recorded in Tables 20 through 27. Herbicide applications for weed control were made on 99.3% of the corn acreage, 99.1% of the soybeans, 7.2% of the wheat, 30.5% of the oats, 11.7% of the alfalfa hay, 1.3% of the other hay, 6.0% of the pasture and 73.5% of the tobacco acreage. By comparison, the data of the 1978 survey showed herbicide use on the same crops as 98.3, 97.4, 4.9, 26.9, 6.0, 0.5, 2.1 and 46.6% of the acreage, respectively. The percentage of corn acreage in each region treated with herbicides for weed control was consistent with eight regions reporting from 99.0% to 99.7% of the acreage treated and the South Central reporting 98.3% (Table 20). Herbicide treated soybean acreage ranged from the low of 92.9% in the East Central Region to the high of 100% in the Southeast with 5 regions reporting 99.3% to 99.5%, (Table 21). Herbicide treatment in the three regions that reported such for tobacco was also consistent on 72.8% to 74.3% of the acreage, (Table 27).

/1/ - "Pesticide Use on Major Crops in Ohio - 1978." H. L. Carter, M. A. Evans and A. C. Waldron. Research Bulletin 1117/Extension Bulletin 666. April 1980. Ohio Agricultural Research and Development Center and Ohio Cooperative Extension Service.

Insecticides were applied to 43.2% of the corn, 42.0% of the alfalfa hay and 50.8% of the tobacco acreages in 1982, (Table 3). In 1978, 49.3%, 32.3% and 38.3% of the three crop acreages, respectively, were treated for insect control. Fungicides were used on 60.6% of the tobacco acreage in 1982 as compared with 70.5% in 1978. Insecticide and fungicide treatments for the other crops in the survey were reported only for a small and somewhat variable percentage of the acreages, (Table 3).

Conventional land tillage practices for field crops continues to be predominant in Ohio. As indicated in Table 4, 67.4% of the total crop acreage was planted following conventional tillage, 27.2% with minimum tillage and only 5.4% with no-tillage. For the crops where the various tillage practices are applicable, approximately 9.8% of the corn and from 1.7% to 2.8% of the soybeans, oats and wheat acreage was farmed with no-tillage. However, only 3.2% of the corn acreage was prepared under procedures where the farmers used no-till as an exclusive practice on that crop with lesser percentages on the other crops, (Table 5). The tillage practices in relation to the growing regions are indicated in Table 6. As expected, the hilly terrain areas of East Ohio utilize no-till cropping to the greatest extent on the existing crop acreage, but the larger field crop acreages are located in the western and central part of the state where soils are less responsive to and the terrain less requiring of no-till practices. These latter areas, however, utilized minimum tillage to a significant percent. It appears, however, no-till farming is not yet a predominant factor in Ohio in the selection and use of farm chemicals.

Weather conditions prior to and during the growing season have a significant effect on the timing, method of application and quantity of pesticides used in Ohio agriculture. Snow covered the ground for most of the 1981-82 winter. Periodic thawing caused melting which later refroze, forming crusted snow and ice which smothered large areas of winter wheat. Cold, wet weather in March and early April killed more wheat, delayed growth and prevented timely fertilization. The adverse winter was the major reason for abandonment of 250,000 acres of wheat, much of which was planted to other crops. After the snows melted almost ideal weather prevailed with the result that corn planting was completed three weeks and soybean planting two weeks ahead of normal. Dry weather prevailed from mid-July through August with below normal precipitation lasting into October. Weather conditions were ideal for the harvesting of field crops. (Ohio Agricultural Statistics-1982. Ohio Crop Reporting Service-June 1983. Agdex 100/850).

B. Herbicides

Approximately 26,567,000 pounds of herbicide active ingredients (a.i.)/2/ were used on major field crops in Ohio in 1982, (Table 7)./3/ This compares with 20,006,000 pounds used on the same crops but 198,500 less acres in 1978. The average application of herbicide a.i. per acre in 1982 was 1.94 pounds which was an increase from the 1.48 pounds applied in 1978. Approximately 16,348,000 pounds or 61.5% of the total herbicide used in 1982 were used on corn and 9,668,500 pounds or 36.4% on soybeans. Of the remaining 2.1%, 332,400 pounds were used on pasture (of which over 75% was picloram used for multiflora rose control), 63,600 pounds in oats, 55,500 pounds in wheat, 70,400 pounds on alfalfa, 21,900 pounds in tobacco and 6,700 pounds for other hay.

The major herbicides used for weed control in corn were atrazine with 5,316,400 pounds (32.5% of the total) used on 3,520,800 acres (80.9% of the acreage), alachlor - 3,299,600 pounds (20.2%) used on 1,641,600 acres (37.7% of the acreage), metolachlor - 2,476,000 pounds (15.1%) used on 1,244,200 acres (28.6% of the acreage), cyanazine - 1,995,400 pounds (12.2%) used on 1,153,400 acres (26.5% of the acreage) and butylate - 1,861,100 pounds (11.4%) used on 518,400 acres (3.1% of the acreage) (Tables 7 and 10). By constrast, only 215,500 pounds of metolachlor were used on 125,300 acres in 1978.

For weed control in soybeans in 1982, Ohio farmers used 3,608,400 pounds of alachlor (37.3% of the total) on 1,768,800 acres (47.2% of the planted acreage), metolachlor - 1,966,500 pounds (20.3%) on 1,003,300 acres (26.8%), chloramben - 983,600 pounds (10.2%) on 642,900 acres (17.1%), metribuzin - 975,500 pounds (10.1%) on 1,950,900 acres (52%), linuron - 786,900 pounds (8.1%) on 1,021,900 acres (27.3%) and trifluralin - 502,800 pounds (5.2%) on 457,100 acres (12.2%), (Tables 7 and 10). In comparison with the 1978 survey, the most significant changes in herbicide use for soybeans was the large increase in the use of metolachlor with the subsequent reduction in percent of the acreage treated with the other major herbicides cited.

The major herbicide used for wheat and oats was 2,4-D which accounted for 65.4% and 70.6% of the total, respectively, used on 4.5% and 19.1% of the planted acreage. MCPA accounted for 18.4% and 17.0% of the herbicide poundage used on 1.7% and 5.8% of the wheat and oats planted acreage, respectively (Tables 7 and 10). Other herbicides were used in lesser amounts. Chemical weed control in alfalfa was divided mainly among 4 chemicals: EPTC - 25,800 pounds used on 11,000 acres, simazine - 12,500 pounds used on 14,000 acres, 2,4-DB - 11,400 pounds used on 11,100 acres and pronamide - 11,200 pounds used on

/2/ - Pounds active ingredient means the pesticide chemical in the formulation and henceforth in this publication will be designated as a.i. or pounds.

/3/ - Quantities of herbicides, insecticides and fungicides were tabulated from survey returns and then expanded to state totals based upon the relationship of acres reported to the estimated total state acreage for the crop.

10,800 acres. However, total herbicide use affected only 11.7% of the alfalfa acreage (Tables 3, 7 and 10). The use of herbicides for weed control in other hay crops was minimal. Picloram and 2,4-D were the prevalent herbicides used on pasture land with 108,000 acres treated with 250,600 pounds of picloram for multiflora rose control and 41,800 acres treated with 65,600 pounds of 2,4-D for broadleaf weed control. Four herbicides were reported used for tobacco: pendimethalin -6,700 pounds used on 3,800 acres, pebulate - 5,800 pounds used on 1,600 acres, diphenamid - 5,700 pounds used on 2,100 acres and benefin - 3,700 pounds used on 2,400 acres.

Alachlor was the herbicide used in the greatest quantity for major field crops in Ohio in 1982 with 6,908,000 pounds constituting 26% of the total herbicide use, (Table 7). In descending order, the next 7 herbicides were atrazine - 5,316,400 pounds and 20%, metolachlor - 4,442,500 pounds and 16.7%, cyanazine - 1,995,400 pounds and 7.5%, butylate - 1,861,100 pounds and 7.0%, chloramben - 983,600 pounds and 37%, metribuzin - 976,800 pounds and 3.7% and linuron - 804,900 and 3.0%. The major change from the 1978 report was the increased usage of metolachlor which somewhat reduced the usage of the other major herbicides. The eight herbicides listed above accounted for 87.7% of that used on major field crops in 1982, with all except 1,300 pounds of metribuzin used on corn and soybeans.

The major weed problems in field crops for which farmers reported the uses of herbicides are listed in Table 17. For corn production and those herbicides that were used on the largest acreages the major uses of: alachlor were for control of Foxtails, general grass weed prevention, fall panicum and yellow nutsedge; atrazine for general broadleaf and grass weed prevention, foxtails, common ragweed, cocklebur and quackgrass; cyanazine for general broadleaf and grass weed prevention, foxtails, fall panicum and common ragweed; dicamba for canada thistle, general broadleaf weed prevention, giant ragweed and cocklebur; and metolachlor for general broadleaf and grass weed prevention, foxtails, yellow nutsedge and fall panicum. Butylate was used in the larger percentage of acres for general grass weed prevention, foxtails, yellow nutsedge, fall panicum and quackgrass; whereas, users of 2,4-D reported the major weed problems as general broadleaf, canada thistle, giant ragweed and cocklebur. Several weeds were reported by farmers as the problems requiring herbicide control measures.

Alachlor was used in soybeans mainly for general grass and broadleaf weed prevention and foxtail control as was also metolachlor, (Table 17). Major weed problems for which linuron was used were general broadleaf and grass weed prevention, common ragweed, jimsonweed, lambsquarter, foxtails and smartweed. Metribuzin was used principally for general broadleaf and grass weed prevention and control of cocklebur, jimsonweed, smartweed, lambsquarter and the ragweeds. The principal uses of chloramben were for general broadleaf and grass weed prevention, foxtails, smartweed and common ragweed. Trifluralin use was mainly for general grass and broadleaf weed prevention and foxtails control.

Canada thistle, general broadleaf weed prevention, cocklebur, giant ragweed and smartweed appeared to be the major weed problems in wheat, (Table 17); whereas, in oats, in addition to the first four weeds indicated above, common ragweed, lambsquarter, morning glory and wild mustard were major problems on a significant acreage. In the alfalfa and other hay crops, the principal use of herbicides was for general broadleaf and grass weed prevention although the control of chickweed, crabgrass and quackgrass was reported as a problem on significant acreage. Multiflora rose control was the major problem of pastures for which herbicides were used followed by general broadleaf and grass weed prevention and control of Canada thistle, dandelion and nightshade. Several weeds were the object of herbicide control in the smaller acreages of tobacco (Table 17).

C. Insecticides

The quantities of insecticides used on major field crops in Ohio in 1982 are indicated in Tables 8, 10 and 12. Five insecticides accounted for 82.7% of the quantity applied: fonofos - 675,700 pounds or 25.1%, terbufos - 672,200 pounds or 25.0%, carbofuran - 553,900 pounds or 20.6%, carbaryl- 172,100 pounds or 6.4% and chlorpyrifos - 151,900 pounds or 5.6 %. Approximately 88.3% of the total quantity of insecticides was used in corn production which was similar to that reported in 1978. Quantities of insecticides used in wheat, oats, alfalfa, other hay and pasture decreased significantly from 1978, whereas, the use in soybeans increased from the former 1.2% to 4.7% and use on tobacco almost doubled. Insecticides were applied to 43.2% of the corn acreage, 3.3% of the soybeans, 42% of the alfalfa hay and 50.8% of the tobacco, (Table 3).

As indicated above the three major insecticides were fonofos, terbufos and carbofuran used exclusively in corn. The quantity of fonofos (675,700 pounds used on 582,500 acres of corn) was more than twice the amount used in 1978 and an increase of 75.9% in acreage treated. Approximately 672,200 pounds of terbufos were used on 497,900 acres of corn which represented a 45.9% increase in the quantitiy used on a 22.1% increase in acreage. On the other hand, the use of carbofuran in 1982 (547,800 pounds on 484,800 acres) decreased by 359,400 pounds and 460,200 acres from the 1978 report. Two other insecticides were used on over 100,000 acres of corn: 151,900 pounds of chlorpyrifos on 144,700 acres and 50,700 pounds of lindane on 112,700 acres. Both of these represent major increases over such uses in 1978. Approximately 78,200 pounds of toxaphene were used on 39,500 acres of corn in 1982, (Table 10). About 52,600 acres of corn were treated with 69,400 pounds of isofenphos which was not reported in use in 1978. Phorate, prophos and carbaryl use in 1982 was fairly comparable to that of 1978; whereas, about the same amount of diazinon was used on about half the former acreage and there were some variations in the use of other insecticides where the quantities and acreages were small in comparison. It should be noted that there were no reports of chlordane and heptachlor use in 1982.

Carbaryl was the major insecticide used on soybeans with 93,500 pounds applied to 86,600 acres, which is over 5 times the use reported in 1978. Carbaryl was also the major insecticide used on wheat and

oats although the use and acreage was relatively insignificant compared to the use on corn and alfalfa. Dimethoate was the insecticide used in the greatest quantity and on the largest acreage for alfalfa hay (52,500 pounds on 124,900 acres) followed by carbaryl, (42,200 pounds on 47,400 acres), (Tables 8 and 10), for the control mostly of potato leafhopper and alfalfa weevil, (Table 18). Dimethoate was used on 27.8% of the alfalfa acreage. The use of Alfa-Tox, methidathion and M&M (including malathion and methoxychlor individually, as well as in combination) decreased signficantly when compared to the 1978 survey. Insecticides were used on only a relatively insignificant percentage of the other hay and pasture acreages. Acephate, carbaryl, carbofuran and diazinon were applied to similar acreage (11.8% to 14.6% of that planted) of tobacco.

The major insect problems reported by farmers are recorded in Table 18. Insects of major concern in corn were corn rootworms, cutworms, corn borers, wireworms, seed corn maggots and beetles. Armyworm, Japanese beetle and common stalk borer were also of concern on appreciable acreage. Alfalfa weevil and potato leafhopper appeared to cause the most concern in alfalfa hay. Tobacco growers used insecticides to control aphids, budworm, cutworm, flea beetles, hornworm and wireworm, although no single insect species appeared to be of predominent concern. Insect control on most other major crops in 1982 appeared to be relatively insignificant (Table 3). However, the major uses of insecticides on soybeans were for control of Mexican bean beetle, bean leaf beetle and Japanese beetle; on wheat- armyworm and cereal leaf beetle; on oats-potato leafhopper and cereal leaf beetle; and on other hay-potato leafhopper, spittlebug, alfalfa weevil and grasshoppers, (Tables 17). On most crops, it appears that farmers have essentially the same insect concerns that were prevalent in 1978. However, the beetles indicated above are becoming serious pest problems in soybeans as evidenced by the increased use of insecticides from 1978 to 1982. A more serious outbreak in 1980 resulted in almost 3 times the acreage treated and amount of insecticide applied as that reported for 1982 according to a survey conducted by USDA-ERS. Ohio research and extension specialists foresee the beetle infestations in soybean as a continuing phenomenon with probable increased used of insecticides in the future. Part of the difference between 1980 and 1982 was probably due to weather conditions in 1982 that hastened the date of planting and later reduced the Mexican bean beetle problem.

D. Fungicides

As indicated in Tables 3, 9, 10 and 13, the use of fungicides for disease control in Ohio major crops was relatively limited being applied to only 2.5% of the total acreage. Fungicides were used on 3.8% of the corn acreage, 2.4% soybean, 4.7% wheat, 2.6% oats and 60.6% tobacco. Captan with 21,400 pounds accounted for 47.5% of the total fungicide quantity used, mancozeb - 20.4%, metalaxyl - 18.5%, carboxin - 13% and maneb - 1.1%. Approximately 16,900 pounds of captan were used on 153,500 acres of corn to prevent seed decay and mold and to control northern corn blight, 3,800 pounds on 64,100 acres of soybeans to prevent seed decay and mold and control Downey Mildew and much lesser amounts on wheat and oats to control smuts, rusts, mosaics, etc., (Table 19). The chief uses of carboxin were for stem and root rot control and prevention of seed decay and mold in soybeans and for

smut control in wheat and oats. Approximately 78% of the carboxin used was applied to 32,800 acres of wheat. All of the 9,300 pounds of mancozeb reported was used on 12,400 acres of corn with 63% of the acreage treated for control of Gibberella ear and stalk rot and 37% for bacterial leaf blight, (Table 19). Maneb was used on 7,300 acres of wheat for smut control and the 8,400 pounds of metalaxyl were used on 47.2% of the tobacco acreage.

E. Other Control

Only two pesticides were reported used for purposes other than weed, insect or disease control by farmers producing major crops in Ohio during 1982. Paraquat was used on 15,000 acres (0.4% of the total) of soybeans as a dessicant, (Table 10), at a quantity of 6,200 pounds. Approximately 25,100 pounds of maleic hydrazide were applied to 50.7% of the tobaco acreage for sucker control.

F. Pesticide Use as Related to Production Regions

The acreages of major field crops in each region treated for weed, insect and disease control are recorded in Tables 20 through 27. The quantities of individual pesticides used in relation to those acreages are reported in Tables 27 through 35 and the percents of the treated acreages for which specific pesticides were applied are reported in Tables 36 through 43.

As indicated in a previous paragraph, the percent of corn and soybean acreage in each region treated with herbicides was consistent, (Tables 20 and 21). As already indicated, atrazine was the most prevalent herbicide used for corn in all regions, (Tables 28 and 36), ranging from 63.9% to 93.1% of the acreage being treated with herbicides receiving such application. Alachlor was second in quantity and percent of treated acreage in all regions except the Northeast and the East Central where metolachlor became of secondary use importance. Metolachlor was the third most commonly used herbicide in the West Central, Central, Southwest and Southeast Regions; whereas, cyanazine was third in the Northwest, North Central and South Central Regions. Dicamba was used in the greatest quantities and on a larger percent of the treated acreages in the Northwest, West Central and Central Regions. The most prevalent use of 2,4-D was in the Northwest followed by the West Central and Central Regions. Butylate use was greatest in the Central and Southwest Regions. The greatest percentage of treated acreage receiving paraquat was the East Central, but the greatest quantity used was in the Central. More simazine was used in the East Central Region than anywhere else.

Metribuzin was the predominant herbicide used in soybeans in the Northwest, West Central, Central and Southwest Regions; whereas, alachlor prevailed in the North Central, South Central and Southeast, (Tables 29 and 37). Soybean farmers in the Northeast Region chose in order of preference linuron followed by metolachlor, alachlor and metribuzin. In the East Central Region the order of preference was metolachlor, bentazon, metribuzin and alachlor. Metribuzin was second in selected usage in the North Central and Southeast Regions and

alachlor was second in the West Central, Central and Southwest Regions. Approximately 66.8% of all the chloramben used for weed control in soybeans in Ohio in 1982 was used in the Northwest Region, whereas 39.1% of the trifluralin was used in the Central Region. Alachlor use ranked third in the Northwest Region. The area of greatest paraquat use both for weed control and as a defoliant was in the Central Region. Other herbicide use relationships as per region can be determined by reference to Tables 29 and 37.

Weed control in wheat was more prevalent in the West Central and Northwest Regions than in the other regions, (Table 22). The predominant herbicide used in the Northwest was 2,4-D followed by MCPA, but in the West Central, the order of preference was reversed, (Tables 30 and 38). Dicamba was the herbicide of third importance in these regions. In all other regions where weed control in alfalfa was of significance, 2,4-D was the herbicide of choice followed by dicamba except in the Southwest. Significant use of glyphosate was reported only in the western sections of the state.

With the exception of the West Central Region where MCPA was used on 7,600 acres of oats and 2,4-D on only 6,000 acres and the Central Region where 2,4-D and dicamba use was approximately equal, 2,4-D was the herbicide of greatest choice in the oats producing regions for control of weeds, (Tables 23, 31 and 39). MCPA was the second most used herbicide in the Northwest Region. Dinoseb was second in the Southwest Region and dicamba second in all the rest except as indicated above. Weed control in alfalfa and other hay did not appear to be of major concern in any region except perhaps the Northeast where 19.7% of the alfalfa and 1.5% of the other hay acreage, (Tables 24 and 25), were treated mostly with 2,4-DB. Over 40% of the alfalfa hay acreage in the state treated with pronamide was in the Northeast Region. The major areas for use of simazine was in the Northeast and West Central Regions. Fifty percent of the EPTC used on alfalfa in the state was applied to 95.5% of the herbicide treated alfalfa acreage in the Northwest, (Tables 32 and 40). The acreage of other hay treated with herbicides for weed control was minimal, (Tables 33 and 41).

Picloram was applied to more pasture acreage in all regions except the Northwest, North Central and West Central than any other herbicide. Dicamba was the only herbicide reported used on pasture in the North Central Region and ranked second to 2,4-D in the West Central Region. 2,4-D was the herbicide of greatest preference in the North Central and Western Regions, (Tables 34 and 42). The Southeast Region treated the largest percentage (7.8%) and thus, the most pasture acreage (43,500 acres) in the state with herbicides and 91.7% of that was with picloram, (Tables 26 and 42). The South Central, East Central and Central Regions were next in order in acreage treated and use of picloram. The largest acreages treated with 2,4-D were also in the Central and South Central Regions. As indicated earlier, multiflora rose was the major weed control problem for pastures.

As shown in Table 27, the three major tobacco growing regions were approximately equal in the percent of the acreage being treated with herbicides but 78% of the total acreage was accounted for in the South Central Region. The use of herbicides in the three regions is shown in Tables 35 and 43.

Insecticide use on corn ranged from 27% of the acreage in the South Central Region to 59.8% in the Southwest. However, the acreage treated ranged from 119,200 acres (48.1%) in the Southeast to 891,000 acres (37.6%) in the Central Region, (Table 20). Fonofos was used on more acres in the state than any other insecticide followed by terbufos and carbofuran (Table 28). The greatest use of fonofos was in the West Central Region where 148,700 acres or 41.7% of the insecticide treated acreage received application of such material. This was followed by the Southwest, Central and Northwest with 110,000 and 40.0%, 101,500 and 30.0% and 97,000 and 33.8%, respectively, (Tables 28 and 36). The percentage of the insecticide treated acreages receiving carbofuran application was fairly consistent among the regions although the Southwest was lower than the average and the South Central, East Central and Southeast Regions somewhat higher (Table 36) and the treated acreages varied in accordance with the total corn acreage for the regions. The application of terbufos was also fairly consistent as percent of the related insecticide treated acreage with again the larger acreages being reported for the western part of the state.

As indicated earlier, the quantity of insecticide use on soybeans was rather minimal (Tables 21 and 29), but the increase of incidence of Mexican bean beetle and bean leaf beetle in relation to 1978 was significant. Carbaryl was the most common insecticide used in 7 of the 9 regions and accounted for application of from 66.4% to 100% of the insecticide treated acreages, (Table 37), but only 1,800 to 22,300 acres in those regions, (Table 29). Insecticide use on wheat, oats and pasture, (Tables 22, 23, 26, 30, 31, 34, 39 and 42), appeared to be of only minor concern in the regions that reported such use. With the exception of the South Central Region insecticides were used on 30.7% to 53.8% of the alfalfa hay acreages in the regions (Tables 24) with dimethoate the chemical of choice in most cases, (Tables 32 and 40). Carbaryl was of secondary importance in the Northwest, North Central, West Central and East Central Regions. Approximately 75.6% of all the parathion (methyl and ethyl) treated acres was located in the Northeast Region. Methoxychlor applications were associated more with the West Central, Southwest and Southeast Regions and methidathion application with the Central and North Central. Only the Northeast Region had over 1,600 acres of other hay treated with any single insecticide in which case dimethoate and parathion were applied to approximately equal acreage (Tables 25, 33 and 41).

Insecticide use on tobacco was a common practice with approximately 82% of the acreage in the West Central and 50% in the Southwest and South Central Regions receiving application, (Tables 27). However, no insecticide showed predominant use in any of the three regions, (Tables 35 and 43).

Although not more than 8.5% of the corn acreage in any region required application of fungicide for disease control, all except the Southeast reported from 12,800 to 32,400 acres treated, (Table 20), with captan being applied to from 84.3% to 100% of the treated acreage in all regions. In addition, mancozeb was applied to 62.7% of the treated acreage in the Southwest, (Tables 28 and 36). The Central and Northwest Regions both had over 25,000 acres of soybeans treated for

disease and other control, (Table 21), with captan the predominant fungicide in all regions reporting disease problems and paraquat used as a defoliant to aid in harvesting, (Tables 29 and 37). Significant wheat acreages in the Northwest and North Central Regions were treated for disease and other control, (Table 22), with carboxin being the major fungicide used in the Northwest and maneb and carboxin approximatey equal in the North Central, (Tables 30 and 38). Carboxin was the only fungicide reported being used for wheat in the Northeast and the major one used in the West Central. Captan was used on 10,900 acres of wheat in the Northwest. The designation of fungicides used was not given for the other Regions although farmers reported that a certain percentage of the wheat acreage was treated for disease control. Fungicide use on oats was also of limited scope, (Tables 23, 31 and 39), with carboxin and captan the only two materials reported being applied in 3 of the 7 regions indicating disease control. Fungicide use was not reported in any regions for pasture and other hay and was insignificant for alfalfa hay in the reports from the Northeast and Northeast, (Tables 24, 25 and 26).

Fungicides and other control chemicals were used on approximately 60% of the tobacco acreage in the Southwest and South Central Regions, (Table 27). Metalaxyl and maleic hydrazide were used on 100% of the treated acreage in the Southwest and 93.4% and 88.4%, respectively, in the South Central. The West Central Region reported maleic hydrazide used on 100% of the 400 acres that were treated, (Tables 35 and 43).

G. Methods of Application

Tables 15 and 16 summarize the data relative to the applicator and method of application of the 15 major herbicides and 15 major insecticides used on major crops in Ohio in 1982. Table 10 provides that data for each crop and each pesticide applied to the crop. Ohio farmers applied approximately 81% of the total quantity of herbicides to 82% of the treated crop acreage and 94% of the quantity of insecticides to 93% of the treated acreage. Comparison with the data for 1978 shows that self application of herbicides increased from 65% of the treated acreage, but the quantity remained the same and that the self application of insecticdes declined only slightly from the 96% of the quantity and 95% of the acreage reported at that time. Aerial application of herbicides accounted for only 1% of the quantity and 1% of the acreage, (Table 15), most of it applied by helicopter. This constitutes a 50% reduction in acreage treated by aerial applicators from the 1978 survey. Approximately 2% of the insecticide active ingredient and acreage treated was applied by aerial procedures equally divided between fixed wing and helicopter aircraft. This also constitutes a reduction from the 3% reported in 1978.

Relative to ground application of herbicides 31% of the quantity was broadcast incorporated on 27% of the acreage compared to 23% and 37%, respectively, in 1978. Surface application for 1982 showed 60% broadcast not incorporated, 7% banded and 1% spot treatment on similar percentages of the acreage, (Table 15). Insecticide ground application for 1982 showed 28% of the quantity incorporated, (27% in the furrow with seed and 1% broadcast), on 29% of the acreage, (28% in furrow and 1% broadcast), (Table 16). This is a slight reduction from

the 32% reported in 1978. Surface application involved 57% of the quantity applied to 52% of the acreage by band application and 13% of the quantity to 17% of the acreage by broadcast. Spot treatment only occurred with a small percentage of diazinon and lindane.

The herbicides used in the greatest quantities on corn and soybeans were also those that involved the largest activity of commercial applicators. Approximately 21% of the atrazine and 30% of the cyanazine applied to corn involved the activity of commercial applicators plus 21% of the alachlor and 18% of the metolachlor applied to corn and soybeans, and 21% of the linuron, 19% of the metribuzin and 20% of the trifluralin applied to soybeans, (Tables 10 and 15). Commercial applicators were responsible for 36% of the paraquat applied to corn and 47% to soybeans, but paraquat use on pasture involved only the farmer. Farmers were responsible for applying 96% of the butylate and dicamba to corn, 94% of the 2,4-D and 85% of the simazine. They were also responsible for applying 73% and 78% of th EPTC in corn and alfalfa hay, respectively, plus 93% of the chloramben and 92% of the bentazon in soybeans. Commercial applicators were involved in the application of 18% of the 2,4-D, 25% of the dicamba and 36% of the MCPA to wheat, as well as relatively large percentages of these herbicides to oats, (Table 10). Involvement of commercial applicators in weed control with other herbicides in major crops, although usually of signficiant percentage but on minimal acreage, can be determined by reference to Tables 10 and 15. It should be noted that the greatest involvement of aerial applicators in herbicide application was with soybeans and wheat.

Insecticides, with only a few notable exceptions, (carbaryl on corn, soybeans, alfalfa and other hay; toxaphene on corn; methoxychlor on alfalfa and the application of some of the organophosphates), were applied mostly by farmers. Approximately 41% of the carbaryl on corn, 60% on soybeans, 42% on alfalfa and 50% on other hay was applied by commercial applicators. Almost half of the toxaphene was applied by commercial applicators. Of the organophosphates all of the oxydemetonmethyl applied to corn, 62% of the dimethoate applied to soybeans, 10% to oats, 11% to alfalfa hay, 12% to other hay and 100% to tobacco; 100% of the parathion on soybeans and 100% of the malathion on wheat and other hay were applied by commercial applicators. In most cases, however, the acreage covered was relatively small. Approximately 37% of the methoxychor was applied to alfalfa by commercial aerial application and 29% of the methidathion was by commercial application.

Tables 10 and 16 show that ground application of insecticides utilized mostly three methods associated generally with the characteristics of the planted crop: broadcast non-incorporated, banded or directed toward the plants for row crops, and in the furrow with the seed at planting. Spot treatment was used to a certain degree for insect control on tobacco. Relationships in application of the insecticides used in minor quantities and on smaller acreages can be ascertained by referral to the data tables.

Approximately 37% of the mancozeb applied to corn for disease control was applied by commercial aerial applicators and the remainder was applied by the farmer in the furrow at time of planting. Captan

was used mostly in the furrow with the corn seed at planting and for all crops where used was applied by the farmer. Carboxin in soybeans was applied by commercial applicators in the furrow with the seed, but in wheat and oats only 17 and 13%, respectively, was by commercial application and 79 and 70% applied in the furrow. Approximately 96% of the metalaxyl and 65% of the maleic hydrazide was applied to tobacco by the grower with 74% of the metalaxyl broadcast incorporated and 70% of the maleic hydrazide broadcast-not incorporated and the remainder applied in band and spot treatment for sucker control, (Tables 10).

H. Personnel Practices in Pesticide Use and Management

A combination of procedures are used by farmers in Ohio to control pests in major crops. Ninety-six percent of the farmers used chemical pesticides, but 87.6% also used crop rotation, 78.2% also used resistant varieties and 68.2% cultivated the fields, (Tables 44). The percent of farmers using chemical pesticides was fairly consistent in all regions of the state; as was also, the use of crop rotation except for the Appalachian area of the South Central and Southeast. The three eastern regions showed the lowest percentages of cultivation as a pest control practice. The use of resistant varieties ranged from 68.6% in the Southeast to 86.5% in the Northwest. The data indicate that biological pest control practices are not yet widespread in the state with only 8.2% of the farmers utilizing that resource and varying from 5.6% to 13.1% in the regions (Table 44). Some organic farming is practiced, but it is relatively insignificant on a state wide basis compared to other farming. The highest percentage was noted for the East Central Region with 9.0% of the farmers involved and the lowest in the Southwest with 1.9%. Less than 1.0% of the farmers in Ohio grew crops without pest control practices ranging from 4.7% in the South Central Region to 0.6% in the Southwest and 0% in the Northwest, North Central, West Central and Central Regions.

Approximately 15.9% of the producers of major field crops in Ohio use some form of integrated pest management (IPM) with the predominence being in corn and soybeans as would be expected, (Table 45). Direct relationship can generally be seen between the acreage of the crop in the region, the prevalence of IPM programs, (Tables 2, 23 and 44), and the availability of IPM information sources although the use of IPM in corn production appears to be fairly well distributed statewide with most regions near the average percentage for the state. Almost 38% of the farmers obtain IPM service from their pesticide dealers, 31% from the Cooperative Extension Service programs and 23.4% from commercial consulting services (Tables 46). However, in the selection and use of pesticides 37.3% of the farmers relied upon their own knowledge and experience as the major source of information and decision, 31.8% depended upon the farm supply dealer and only 19.1% used the services of the Cooperative Extension Service (Table 47). Except in the North Central Region very few farmers used crop scouts and consultants as the source of information in deciding what pesticides to use. Survey results also showed that the media and advertisements, although perhaps making the farmer aware of products on the market, had relatively little effect in the decision making process.

In relation to the involvement of the farm family members and/or farm employees in pesticide application, 97.3% indicated that such personnel were involved with the complete process of mixing, loading and applying; whereas, only 5.6% mixed and loaded but did not apply and 6.7% were involved only in the application process, (Table 48). However, although 97.6% of the respondents were involved in all aspects of pesticide use only 72.2% were certified as pesticide applicators, (Table 49). The data was fairly well applicable to all regions in the state.

Facilities involving separate buildings designated exclusively for pesticide storage were reported by 20.7% of the producers of major field crops, (Table 50). The East Central and Northwest Regions had the lowest percentage of separate pesticide storage facilities with 13.2% and 15.3%, respectively, while the Southwest had the highest percentage at 26.7%. Approximately 51.4% of the pesticide storage was in conjunction with farm equipment and 19.9% in buildings also housing feed. The use of equipment facilities varied from a low of 40.6% in the South Central Region to a high of 61.4% in the North Central (Table 50). The low at 12.5% for pesticide storage with feed products was noted for the Southeast Region and the high of 26.5% in the Northwest. Regardless of the storage area used for pesticides, 21.9% of the farmers kept that particular area locked with most of the regions indicated percentage near the state average, but the extremes ranging from a low of 17.6% in the Southwest to 29.2% in the North Central.

Most of the farmers in Ohio appear to use approved methods in disposing of pesticide containers although the data did not reveal the timeliness in disposal procedures. Only 5.8% of the responding farmers indicated that they used some containers for other purposes on the farm rather than disposing of them, (Table 51), and this varied from a low of 0.9% in the South Central Region to a high of 9.2% in the Northeast. Some storage of containers occurred on farms for a period of time at least until the opportunity for adequate disposal was available or the work schedule permitted such activity. More than 54% of the farmers indicated that they burned combustible containers on the farm premises with the variation not being more than plus or minus 7% from the state average for each region. The survey response indicates that Ohio farmers use the triple rinse procedure for cleaning metal and plastic containers prior to disposal. Although the state average recorded is 59.9% for triple rinse if one considers that the type of containers used are about equally divided between combustible and non-combustible containers (54.2% of farmers burned containers on farm indicating combustible containers and 59.9% triple rinsed indicating non-combustible), it appears that the triple rinse decontamination procedure is more prevalent than previously surmised. In the subsequent disposal of non-combustible containers, (and probably some combustible containers), 13.2% of the farmers indicated burial on farm, 41.2% used an approved landfill or disposal facility and 9.5% returned the container to the dealer. Approximately 10.7% of the farmers disposal of containers by means other than those listed. There was considerable variation among the regions as to the facilities used for disposal of other than burning. It can be noted that in most cases with regional data where the percent is low for approved disposal sites and returning to the dealer, (East Central and Southeast Regions), the percent for burial on the farm is the highest and the opposite is

generally true where the larger percentages used approved disposal sites and/or returned containers to the dealer (Northwest and North Central Regions). The most notable exceptions to that phenomenon might be for the South Central Region where 43.4% of the farmers used approved disposal sites but 22.6% also buried containers on the farm, the Southwest Region where 40% used approved disposal sites and only 7.4% used farm burial but 20% used other disposal facilties or methods, and the Central Region where 37.4% used approved sites and 15.8% returned containers to the dealer but 15.3% used other facilties and only 9.9% used farm burial, (Table 51). It is understandable that disposal sites are contingent upon the facilities available. This survey did not attempt to determine the availability of approved landfills nor the opportunity to return containers to the dealers in the various counties.

The data in Tables 52 and 53 indicate that most farmers in Ohio involved in mixing/loading and/or applying pesticides used conventional type work clothing generally consisting of a long sleeved shirt, cotton and demin work pants, a cap or hat head covering, some type of work gloves, and work boots or shoes. Only 18% of those mixing and loading pesticides and 17% of those applying pesticides used a spray suit or coverall. A slightly higer percentage of pesticide workers used a spray suit when working with the highly toxic pesticides than with those in the moderately and slightly toxic categories. Rubber boots were worn by 20% of the mixer-loaders and 17% of the applicators of highly toxic pesticides compared to 15-16% and 12%, respectively, of those involved with less toxic materials. The percentage of farmers using respirators is even less with 13% of those mixing/loading and 10% applying highly toxic pesticides using such safety devices and 7-9% of those using the less toxic materials. Approximately an equal percentage used dust masks when involved with powder and/or granular formulations. The survey failed to completedly identify the type of gloves worn by the respondents, but it is assumed that a reasonable percentage could be designated as rubber gloves because the question requested information of pesticide protective clothing and equipment. The greater percentage of farmers using gloves during mixing-loading operations vs. spraying also indicates such to be the case. The survey response showed an increase in the percentage of farmers having enclosed cab tractors from that of 1978; i.e. 24% vs. 17%. Also 4% reported having closed delivery systems in mixing and loading the pesticides. These two factors plus the reported use of dust masks could account for some of the reduction in the use of respirators from the 16% reported in 1978. Other comparisons shows an increase from 10% in 1978 to 17-18% in 1982 of the farmers involved with pesticide operations wearing spray suits or coveralls and an increase from 23% to 31%, respectively, using face shields or goggles when mixing-loading.

Attempts were made by computer analysis to correlate the use of protective clothing and equipment in relation to the toxicity of specific pesticides. Tables 52 and 53 thus contain a tabulation of the response to the question or use of protective clothing and equipment related to selected pesticides that were reported used by the respondent. Although the method of clientele response may not have allowed for differentiation of clothing or equipment used by the individual farmer if he used two or more pesticides of different toxicity levels on the same crop, the data do show some

pesticides/protection relationships. The relationship is further verified by correlating the data in Tables 52 and 53 with the pesticide-crop usage in Tables 7, 8 and 9 and a basic knowledge of the major pesticide formulations used for the different crop production systems.

The data in Table 54 indicates that farmers are generally aware of the difference in toxicity of pesticides and the relation that toxicity has toward the requirements for protective clothing and equipment. In most cases, the greater the toxicity of the pesticide the higher percentage of farmers that used various items of protection. The comparisions shown in Table 54 were made for specific pesticides of the different toxicity categories either from the same chemical grouping used on the same crop or from pesticides used for the same general pest control practice on the same crop. The data are also influenced by the type of formulation involved as indicated earlier.

Farmers were much more likely to wear gloves, a long sleeved shirt, head covering, rubber boots and a face shield when mixing-loading pesticides than when applying the same, except when using the parathions and disulfoton. In the latter case the use of protective clothing and equipment was similar for both mixing-loading and spraying. Generally, the mixer-loading (Tables 52 and 54) seemed to be fairly consistent in their use of various items of protective clothing, etc., regardless of the toxicity and the formulation of the pesticide being used. The applicators (Tables 53 and 54) appeared to be much less concerned with exposure after the formulations were mixed in the application equipment. This is likely to be expected especially when the pesticides is applied in granular form with or adjacent to the seed hopper, incorporated subsurface during land preparation or planting, or applied with equipment providing the applicator with an enclosed tractor or truck cab.

I. Summary of Trends in Pesticide Use and Practices

Some comparisons of the 1978 and 1982 survey data showing trends in pesticide use have been included in the preceeding sections of the text. Changes may be due in some cases to differences in pest pressures but in others to new pest problems, availability and choice of pesticide, cropping practices, pesticide use regulations, etc. There was a slight increase in the percentage of corn and soybean acreage treated with herbicides in 1982 for weed control with less than 1% of the acreage now untreated. The percent of acreage for chemical weed control in wheat, alfalfa hay, tobacco and pasture in 1982 showed increases of from 63% to more than double that of 1978. There was an increase in the percent of alfalfa and tobacco acreage treated for insect control but a decrease in the wheat, small grains and pasture. There was a slight decrease in the percent of corn acreage treated with insecticide in 1982 even though the total acreage treated was equal to that of 1978. A significant increase in insect control treatment for soybeans was noted in 1980 and 1982 and attributed to the Mexican bean and bean leaf beetle problems. It was also noted that the use of fungicides in 1982 more than doubled over 1978 for corn, wheat and small grains, and remained the same for

soybeans. Although fungicide use decreased in relation to the percent of the tobacco acreage,it increased for the total acres treated.

There was not much difference in the type of herbicides selected for weed control between the two surveys. The major differences for 1982 were the great increases in the use of metolachlor for corn and soybeans and a significant increase in pasture weed and brush control using 2,4-D and pilcoram. The major differences for insect control were the reversal in the order of preference for carbofuran, terbufos and fonofos in corn; increased use of carbaryl in soybeans related to the beetle problems; and greater reliance on dimethoate and carbaryl for insect control in alfalfa rather than Alfa-Tox and M&M. Captan and mancozeb showed a significant increase in use for disease control in corn in 1982. The major weed, insect and disease problems were essentially the same for the two reporting periods except, as indicated, the increased pest pressures from Mexican bean beetle and bean leaf beetle in soybeans. The potato leafhopper appeared to replace the alfalfa weevil as the major insect of concern in alfalfa in 1982. However, this may be only a seasonal phenomenon.

The percent of acreage treated for weed control by the farmer (private applicator) increased from 65% in 1978 to 82% in 1982 but the percent of the quantity of herbicide remained the same. There was no significant change in the application of insecticides by self vs. commercial. Methods of application did not change very much although the increased emphasis and use of no-tillage and minimum tillage practices may have initiated some change that will be more noticeable in the future.

The use of chemical pesticides still remains the major means of pest control for field crops in Ohio. Cultivation is a common practice in much of the state and the use of crop rotation and resistant crop varieties are widespread means of pest control. Farmers still rely upon their own experience and the farm supply dealer as the major resources for information on pesticide use. The Extension Service ranks third as the preferred source of information. The percent of farmers who are certified applicators has increased from 66% in 1978 to 72% in 1982. Certification requirements have had some influence on the compliance of farmers regarding proper storage and disposal of pesticides and the use of personal protection measures. However, the data for 1982 indicates that appropriate training with emphasis on safe practices must be a continuing process.

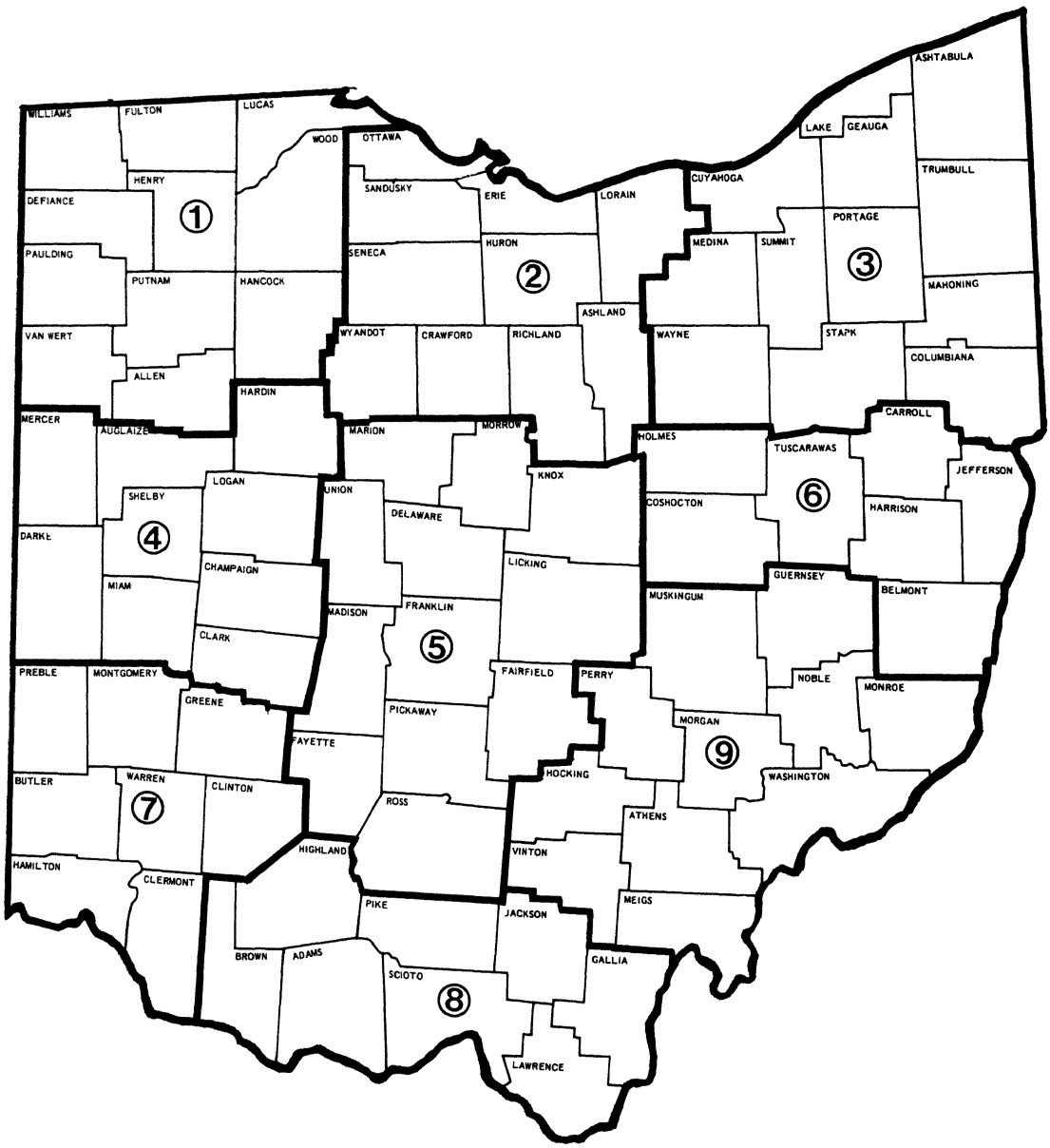

Fig. 1: Agricultural Production Regions in Ohio

TABLE 1. NUMBER OF USABLE SURVEY REPORTS AND CROP ACREAGE SUBMITTED BY RECIPIENTS RELATIVE TO PESTICIDE USE ON MAJOR FIELD CROPS IN OHIO - 1982

REGION & STATE	CORN		SOYBEANS		WHEAT		OATS		ALFALFA HAY		OTHER HAY		PASTURE		TOBACCO	
	Total Rpts	Acreage Rptd	Total Rpts	Acreage Rptd	Total Rpts	Acreage Rptd	Total Rpts	Acreage Rptd	Total Rpts	Acreage Rptd	Total Rpts	Acreage Rptd	Total Rpts	Acreage Rptd	Total Rpts	Acreage Rptd
Northwest	527	81,761	553	94,512	441	25,582	202	6,122	93	2,717	53	1,632	47	1,108	0	0.0
No. Central	343	50,878	341	50,443	293	16,847	160	3,902	125	4,566	78	1,920	93	2,310	0	0.0
Northeast	345	40,366	132	11,902	188	7,507	217	5,410	169	8,279	153	4,818	151	4,394	1	0.4
West Central	466	76,833	445	60,471	380	19,755	133	2,503	143	5,006	83	1,702	122	4,314	6	29.4
Central	418	77,307	337	64,376	297	17,560	97	2,096	127	3,623	140	4,124	153	7,415	1	1.5
East Central	228	18,439	24	1,081	101	1,799	127	2,247	127	5,286	109	4,108	122	6,811	0	0.0
Southwest	276	50,118	229	28,186	179	7,750	29	771	60	1,412	97	2,450	117	4,789	21	88.1
So. Central	188	17,263	120	11,834	98	3,787	21	275	41	819	121	4,687	121	7,466	147	455.4
Southeast	251	14,301	20	1,319	82	1,617	65	783	108	2,362	186	7,831	185	14,547	0	0.0
State	3042	427,266	2201	324,124	2059	102,204	1051	24,109	993	34,340	1020	33,272	1101	53,154	176	574.8
State Acreage for Crop	4,350,000		3,750,000		1,500,000		340,000		450,000		850,000		2,400,000		14,400	
% of State Acreage Reported	9.8		8.6		6.8		7.1		7.6		3.9		2.2		4.0	

Rpts = Reports; Rptd = Reported

TABLE 2. PERCENT OF OHIO MAJOR FIELD CROP ACREAGE REPORTED BY SURVEY RECIPIENTS - 1982

REGION & STATE	CORN		SOYBEANS		WHEAT		OATS		ALFALFA HAY		OTHER HAY		PASTURE		TOBACCO	
	Total Acres (1000)	% Rptd	Total Acres (1000)	% Rptd	Total Acres (1000)	% Rptd	Total Acres (1000)	% Rptd	Total Acres (1000)	% Rptd	Total Acres (1000)	% Rptd	Total Acres (1000)	% Rptd	Total Acres (1000)	% Rptd
Northwest	780.0	10.5	1053.0	9.0	489.2	5.2	72.0	8.5	42.0	6.5	24.0	6.8	64.0	1.7	0.0	0.0
North Central	540.0	9.4	660.0	7.6	267.6	6.3	59.0	6.6	62.0	7.4	40.0	4.8	120.0	1.9	0.0	0.0
Northeast	350.0	11.5	110.0	10.8	50.6	14.8	69.0	7.8	100.0	8.3	140.0	3.4	233.0	1.9	0.0	a
West Central	780.0	9.9	680.0	8.9	267.8	7.4	60.0	4.2	81.0	6.2	36.0	4.7	163.0	2.6	1.2	2.5
Central	900.0	8.6	755.0	8.5	260.0	6.8	30.0	7.0	49.0	7.4	99.0	4.9	370.0	2.0	0.1	1.5
East Central	170.0	10.8	6.5	16.6	11.9	15.1	28.0	8.0	64.0	8.3	136.0	3.0	355.0	1.9	0.0	0.0
Southwest	460.0	10.9	330.0	8.5	89.7	8.6	7.0	11.0	26.0	5.4	51.0	4.8	183.0	2.6	1.8	4.9
South Central	250.0	6.9	150.0	7.9	51.0	7.4	5.0	5.5	6.0	13.7	124.0	3.8	350.0	2.1	11.3	4.0
Southeast	120.0	11.9	5.5	24.0	12.2	13.3	10.0	7.8	20.0	13.2	200.0	3.9	562.0	2.6	0.0	0.0
State	4,350.0	9.8	3,750.0	8.6	1500.0	6.8	340.0	7.1	450.0	7.6	850.0	3.9	2400.0	2.2	14.4	4.0

a - 0.4 acre reported but not significant in the total and no bases for calculating percentage.

TABLE 3. ACREAGES PLANTED AND TREATED WITH PESTICIDES BY CROPS, OHIO 1982

Region & State	Acres Planted 1/,2/	Percent of planted acreage treated for control of:			Planted acreage treated for control of:		
		Weeds	Insects	Disease and Other Control	Weeds	Insects	Disease and Other Control
	1,000 Acres	Percent			1,000 Acres		
Corn	4,350.0	99.3	43.2	3.8	4,320.0	1,879.0	165.0
Soybeans	3,750.0	99.1	3.3	2.4	3,716.0	124.0	90.0
Wheat	1,500.0	7.2	0.4	4.7	108.0	6.0	70.0
Oats	380.0	30.5	0.6	2.6	116.0	2.0	10.0
Alfalfa Hay	450.0	11.7	42.0	0.2	53.0	189.0	1.0
Other Hay	850.0	1.3	1.7	-	11.0	14.0	-
Pasture	2,400.0	6.0	0.2	-	144.0	5.0	-
Tobacco	14.4	73.5	50.8	60.6 /3/	10.6	7.3	8.7/3/
Total	13,694.4	62.1	16.3	2.5	8,478.6	2,226.3	345.0

1/
Current estimates of SRS, USDA. Harvested acreage for hays and tobacco. Unofficial estimates for pasture grazed.

2/
Other crops not designated but reported by farmers for percent of planted acreage treated for pest control: Weed control - 49.6%, insect control - 32.3%, disease and other control - 41.3%.

3/
Of the total acreage for tobacco 7,900 acres or 55.0% were treated for disease control and 8,100 acres or 56.1% were treated for other control, but summarization of the data from district compilation indicated that 60.6% of the total acreage or 8,700 acres received treatment for either disease or other control or both.

TABLE 4. METHOD OF LAND PREPARATION, OHIO 1982 /a/

CROP	Acres Planted	Percent of Acres Planted			Acreage Planted		
		No-Till	Minimum Till	Conventional Till	No-Till	Minimum Till	Conventional Till
	1,000 Acres						
Corn	4,350	9.8	29.8	60.4	426.3	1,296.3	2,627.4
Soybeans	3,750	1.7	20.8	77.5	63.8	780.0	2,906.2
Wheat	1,500	2.8	35.3	61.9	42.0	529.5	928.5
Oats	380	2.4	29.6	68.0	9.1	112.5	258.4
Total	9,980	5.4	27.2	67.4	541.2	2,718.3	6,720.5

/a/ Definitions: No-Till: no breaking of soil except where seed is planted.
Minimum of reduced till: breaking of soil with no turning of soil
Conventional: turning of soil.

TABLE 5. METHOD OF LAND PREPARATION BY EXCLUSIVE METHODS, OHIO 1982 /a/

CROP	Acres Planted	Percent of Land Planted Exclusively by			Acreage Planted Exclusively		
		No-Till	Minimum Till	Conventional Till	No-Till	Minimum Till	Conventional Till
	1,000 Acres	Percent			1,000 Acres		
Corn	4,350	3.2	14.2	41.5	139.2	617.7	1,805.3
Soybeans	3,750	0.5	13.0	63.3	18.8	487.5	2,373.8
Wheat	1,500	1.7	33.7	60.0	25.5	505.5	900.0
Oats	380	1.9	27.5	66.6	7.2	104.4	253.1
Total	9,980	1.9	17.2	53.4	190.7	1,715.2	5,332.2

/a/ See definition in Table 4.

TABLE 6. METHOD OF LAND PREPARATION BY REGIONS IN OHIO - 1982 /a/

REGION & STATE	PERCENT OF CROP ACREAGE PRODUCED BY TILLAGE PRACTICES											
	CORN			SOYBEANS			WHEAT			OATS		
	No Till	Minimum Till	Conventional Till	No Till	Minimum Till	Conventional Till	No Till	Minimum Till	Conventional Till	No Till	Minimum Till	Conventional Till
Northwest	3.1	28.7	68.2	0.4	18.3	81.3	0.1	32.7	67.2	4.8	40.1	55.1
North Central	12.3	35.0	52.6	2.8	24.6	72.5	12.3	35.1	52.5	2.0	27.3	70.6
Northeast	13.1	38.4	48.5	5.0	36.7	58.3	6.1	33.4	60.4	3.3	19.5	77.2
West Central	6.0	30.9	63.2	1.0	21.4	77.5	0.3	35.6	64.1	0.8	27.5	71.7
Central	10.5	29.8	59.7	2.5	14.9	82.7	1.5	36.4	62.1	1.8	35.2	63.0
East Central	30.7	30.5	38.9	5.5	61.4	33.1	4.4	32.9	62.8	0.5	34.0	65.5
Southwest	8.3	22.7	69.0	1.5	24.5	74.0	0.0	43.5	56.5	0.3	21.5	78.2
South Central	13.2	18.0	68.9	2.9	26.6	70.5	1.5	40.6	57.9	0.0	30.4	69.2
Southeast	20.2	31.3	48.5	5.0	32.6	62.4	1.1	44.8	54.1	0.0	27.5	72.5
State /b/	9.8	29.8	60.4	1.7	20.8	77.5	2.8	35.3	61.9	2.4	29.6	68.0

/a/ See Table 4 for definitions.
/b/ Weighed computation.

TABLE 7. QUANTITIES OF HERBICIDES USED ON OHIO CROPS, ACTIVE INGREDIENT 1982

HERBICIDE	CORN	SOYBEANS	WHEAT	OATS	ALFALFA HAY	OTHER HAY	PASTURE	TOBACCO	TOTAL /1/
					1,000 lbs				
2,4-D	261.3		36.3	44.9		2.5	65.6		410.6
2,4-DB		8.9		2.2	11.4	1.8			24.3
Actifluorfen		90.5							90.5
Alachlor	3,299.6	3,608.4							6,908.0
Atrazine	5,316.4								5,316.4
Benefin					2.2			3.7	5.9
Bentazon	8.1	342.3							350.4
Bifenox		36.8							36.8
Butylate	1,861.1								1,861.1
Chloramben		983.6							983.6
Chlorbromuron		a							a
Cyanazine	1,995.4								1,995.4
Dicamba	228.0		3.2	5.7		2.4	7.8		247.1
Diclofop-Methyl		11.1							11.1
Dinoseb		7.5	a	a					7.5
Diphenamid								5.7	5.7
EPTC	415.2				25.8				441.0
Fluchloralin		46.6							46.6
Glyphosate	44.1	44.3	5.8				6.0		100.2
Isopropalin								a	a
Linuron	18.0	786.9							804.9
MCPA			10.2	10.8					21.0
Metolachlor	2,476.0	1,966.5							4,442.5
Metribuzin		975.5			1.3				976.8
Naptalam		18.3							18.3
Naptalam & Dinoseb		118.6							118.6
Oryzalin		7.3							7.3
Paraquat	104.5	16.4					2.4		123.3
Pebulate								5.8	5.8
Pendimethalin	13.4	67.2						6.7	87.3
Picloram							250.6		250.6
Profluralin		19.3			6.0				25.3
Pronamide					11.2				11.2
Propachlor	9.5								9.5
Sethoxydin		a							a
Simazine	297.4				12.5				309.9
Trifluralin		502.8							502.8
Vernolate		9.7							9.7
Total /1/	16,348.0	9,668.5	55.5	63.6	70.4	6.7	332.4	21.9	26,567.0

/a/ Quantity not published when less than 500 acres treated.
/1/ Total does not include quantities applied to less than 500 acres for individual crops.

TABLE 8. QUANTITIES OF INSECTICIDES USED ON OHIO CROPS, ACTIVE INGREDIENTS 1982

INSECTICIDE	CORN	SOYBEANS	WHEAT	OATS	ALFALFA HAY	OTHER HAY	PASTURE	TOBACCO	TOTAL /1/
					1,000 lbs				
Acephate		a						1.8	1.8
Azinphosmethyl					0.7	a			0.7
Carbaryl	26.4	93.5	1.8	0.7	42.2	5.7		1.8	172.1
Carbophenothion		a							a
Carbofuran	547.8				3.0			3.1	553.9
Chlorpyrifos	151.9								151.9
Diazinon	31.6	17.6						3.0	52.2
Diazinon & Methoxychlor					4.9				4.9
Dimethoate	2.8	1.9		a	52.5	1.4		a	58.6
Disulfoton	1.7							1.9	3.6
Fenvalerate		a							a
Fonofos	675.7								675.7
Isofenphos	69.4								69.4
Lindane	50.7	2.3	a						53.0
Malathion		9.0	0.8	a	10.1	2.6		0.6	23.1
Malathion & Methoxychlor					12.5				12.5
Methidathion					13.7				13.7
Methiocarb	a								a
Methomyl	1.7				a				1.7
Methoxychlor					14.6				14.6
Methyl Parathion					2.6				2.6
Oxydemetonmethyl	1.9								1.9
Parathion		1.4			5.4	0.6	0.3		7.7
Phorate	50.4	1.1							51.5
Phosmet					0.8				0.8
Prophos	11.9								11.9
Terbufos	672.2								672.2
Toxaphene	78.2			a					78.2
Trichlorfon	a								a
Total /1/	2,374.3	126.8	2.6	0.7	163.0	10.3	0.3	12.2	2,690.2

/a/ Quantity not published when less than 500 acres treated.
/1/ Total does not include quantities applied to less than 500 acres for individual crops.

TABLE 9. QUANTITIES OF FUNGICIDES & OTHER CONTROLS USED ON OHIO CROPS, ACTIVE INGREDIENTS 1982

FUNGICIDE AND OTHER CONTROL	CORN	SOYBEANS	WHEAT	OATS	ALFALFA HAY	OTHER HAY	PASTURE	TOBACCO	TOTAL
					1,000 lbs				
Captan	16.9	3.8	0.6	0.1					21.4
Carboxin		0.8	4.6	0.5					5.9
Mancozeb	9.3								9.3
Maneb			0.5						0.5
Metalaxyl								8.4	8.4
Maleic Hydrazide								25.1	25.1
Paraquat (Defoliant)		6.2							6.2
Total	26.2	10.8	5.7	0.6				33.5	76.8

TABLE 10. ACREAGES TREATED, RATES PER ACRE, APPLICATIONS AND METHOD OF APPLICATION, BY CROPS AND PESTICIDE, OHIO 1982

PESTICIDE	Acres		Quantity Applied Active Ingredient		Method of Application								
					Applicator		Aerial		Ground				
	Treated (000)	Percent of Planted	Per Acre	Total (000)	Self	Commercial	Airplane	Helicopter	Broadcast Incorporated	Broadcast not incor.	Band	Row With Seed	Spot
			(Pounds)		(Percent)		(Percent)		(Percent)				
CORN (4,350,000 ACRES)													
HERBICIDES:													
2,4-D	544.3	12.5	0.48	261.3	94	6		1	2	79	5		13
Alachlor	1,641.6	37.7	2.01	3,299.6	79	21	1		16	72	11		
Atrazine	3,520.8	80.9	1.51	5,316.4	79	21			32	64	4		
Bentazon	8.6	0.2	0.94	8.1	98	2				64			36
Butylate	518.4	11.9	3.59	1,861.1	96	4		1	98	1			
Cyanazine	1,153.4	26.5	1.73	1,995.4	70	30			29	62	9		
Dicamba	786.2	18.1	0.29	228.0	96	4		1	2	77	4		16
EPTC	95.0	2.2	4.37	415.2	73	27			85	15			
Glyphosate	30.2	0.7	1.46	44.1	97	3			10	62			28
Linuron	17.3	0.4	1.04	18.0	96	4			17	83			
Metolachlor	1,244.2	28.6	1.99	2,476.0	78	22			31	66	3		
Paraquat	254.9	5.9	0.41	104.5	64	36			6	94			
Pendimethalin	8.6	0.2	1.56	13.4	63	37				100			
Propachlor	4.3	0.1	2.20	9.5	100	0				100			
Simazine	194.4	4.5	1.53	297.4	85	15			18	82			
INSECTICIDES:													
Carbaryl	24.4	0.6	1.08	26.4	59	41	17	16	9	19	23	16	
Carbofuran	484.8	11.1	1.13	547.8	98	2			2	3	58	37	
Chlorpyrifos	144.7	3.3	1.05	151.9	100					7	68	25	
Diazinon	39.5	0.9	0.80	31.6	99	1					7	92	1
Dimethoate	5.6	0.1	0.50	2.8	c	c	c	c	c	c	c	c	c
Disulfoton	1.9	b	0.90	1.7	100						100		
Fonofos	582.5	13.4	1.16	675.7	100				2	4	81	13	
Isofenphos	52.6	1.2	1.32	69.4	98	2					72	28	
Lindane	112.7	2.6	0.45	50.7	100					3	1	94	2
Methiocarb	a				100				79			21	
Methomyl	3.8	0.1	0.45	1.7	100					100			
Oxydemetonmethyl	3.8	0.1	0.50	1.9		100		100					
Phorate	37.6	0.9	1.34	50.4	100					16	79	5	
Prophos	13.2	0.3	0.90	11.9	100				31	1	59	9	
Terbufos	497.9	11.4	1.35	672.2	99	1			1	3	59	37	
Toxaphene	39.5	0.9	1.98	78.2	51	49			7	77	16		
Trichlorfon	a					100	100						
FUNGICIDES:													
Captan	153.5	3.5	0.11	16.9	99	1				3		95	2
Mancozeb	12.4	0.3	0.75	9.3	63	37	37					63	
SOYBEANS (3,750,000 ACRES)													
HERBICIDES:													
2,4-DB	29.7	0.8	0.30	8.9	61	39		31	11	46	5		7
Actifluorfen	156.1	3.6	0.58	90.5	91	9	1	1	2	64	5		27
Alachlor	1,768.8	47.2	2.04	3,608.4	79	21		1	17	70	12		
Bentazon	349.3	9.3	0.98	342.3	92	8		1	1	57	10		31
Bifenox	37.2	1.0	0.99	36.8	67	33			25	72	3		
Chloramben	642.9	17.1	1.53	983.6	93	7		1	22	39	38		
Chlorbromuron	a				100		c	c	c	c	c	c	c
Diclofop-Methyl	11.1	0.3	1.00	11.1	67	33		4		82			14

PESTICIDE	Acres		Quantity Applied Active Ingredient		Method of Application								
					Applicator		Aerial		Ground				
	Treated (000)	Percent of Planted	Per Acre	Total (000)	Self	Commercial	Airplane	Helicopter	Broadcast Incorporated	Broadcast not incor.	Band	Row With Seed	Spot
SOYBEANS (Continued)			(Pounds)		(Percent)		(Percent)		(Percent)				
HERBICIDES (Continued):													
Dinoseb	3.7	0.1	2.02	7.5	33	67			67	33			
Fluchloralin	40.9	1.1	1.14	46.6	88	12			93				7
Glyphosate	37.2	1.0	1.19	44.3	93	7				35	1		64
Linuron	1,021.9	27.3	0.77	786.9	79	21			11	85	4		
Metolachlor	1,003.3	26.8	1.96	1,966.5	86	14		2	27	67	4		
Metribuzin	1,950.9	52.0	0.50	975.5	81	19		1	41	53	5		
Naptalam	11.1	0.3	1.65	18.3	68	32	43	27		9			21
Naptalam & Dinoseb	81.8	2.2	1.45	118.6	90	10	1		5	78	3		13
Oryzalin	7.4	0.2	0.99	7.3	63	37			21	58	21		
Paraquat	37.2	1.0	0.44	16.4	53	47	2	3	2	93			
Pendimethalin	59.5	1.6	1.13	67.2	80	20		8	37	53	2		
Profluralin	18.6	0.5	1.04	19.3	62	38		10	90				
Sethoxydin	a				100			6		68			26
Trifluralin	457.1	12.2	1.10	502.8	80	20		2	96	2			
Vernolate	3.7	0.1	2.62	9.7	100				100				
INSECTICIDES:													
Acephate	a				100					100			
Carbaryl	86.6	2.3	1.08	93.5	40	60	21	20	1	32	26		
Carbophenothion	a				100					100			
Diazinon	11.2	0.3	1.57	17.6	100							100	
Dimethoate	4.3	0.1	0.44	1.9	38	62	24	45		18	13		
Fenvalerate	a					100		100					
Lindane	15.6	0.4	0.15	2.3	100				6			94	
Malathion	6.0	0.2	1.50	9.0	c	c	c	c	c	c	c	c	c
Parathion	0.9	b	1.50	1.4		100		100					
Phorate	0.7	b	1.50	1.1	c	c						100	
FUNGICIDES:													
Captan	64.1	1.7	0.06	3.8	100				3		97		
Carboxin	10.6	0.3	0.08	0.8		100						100	
OTHER CONTROL:													
Paraquat (Defoliant)	15.0	0.4	0.41	6.2	57	43	11	6		83			
WHEAT (1,500,000 ACRES)													
HERBICIDES:													
2,4-D	67.2	4.5	0.54	36.3	82	18	10	1	2	79	4		4
Dicamba	19.0	1.3	0.17	3.2	75	25				89	4		7
Dinoseb	a				100					100			
Glyphosate	4.6	0.3	1.25	5.8	100				19	18			63
MCPA	24.8	1.7	0.41	10.2	64	36	35	6	2	57			
INSECTICIDES:													
Carbaryl	1.1	0.1	1.60	1.8	100					100			
Lindane	a				100							100	
Malathion	1.1	0.1	0.75	0.8		100	c	c	c	c	c	c	c

TABLE 10. (Continued - Page three)

PESTICIDE	Acres		Quantity Applied Active Ingredient		Method of Application								
					Applicator		Aerial		Ground				
	Treated (000)	Percent of Planted	Per Acre	Total (000)	Self	Commercial	Airplane	Helicopter	Broadcast Incorporated	Broadcast not incor.	Band	Row With Seed	Spot
			(Pounds)		(Percent)		(Percent)		(Percent)				
WHEAT (Continued)													
FUNGICIDES:													
Captan	8.6	0.6	0.07	0.6	100					24		76	
Maneb	7.3	0.5	0.00	0.5	100					6		94	
Carboxin	32.8	2.2	0.14	4.6	83	17			21			79	
OATS (380,000 ACRES)													
HERBICIDES:													
2,4-D	72.4	19.1	0.62	44.9	81	19	2	2	6	79	10		1
2,4-DB	3.2	0.9	0.68	2.2	67	33			32	65	3		
Dicamba	19.0	5.0	0.30	5.7	70	30			2	91	6		1
Dinoseb	a				100					100			
Glyphosate	a				100					100			
MCPA	22.0	5.8	0.49	10.8	82	18	15		11	68	6		
INSECTICIDES:													
Carbaryl	1.0	0.3	0.67	0.7	100				26	74			
Dimethoate	a					100				100			
Malathion	a				100		c	c	c	c	c	c	c
Toxaphene	a				c	c	c	c	c	c	c	c	c
FUNGICIDES:													
Captan	1.3	0.3	0.07		100		c	c	c	c	c	c	c
Carboxin	4.6	1.2	0.10	0.5	87	13				30		70	
ALFALFA HAY (540,000 ACRES)													
HERBICIDES:													
2,4-DB	11.1	2.5	1.03	11.4	86	14	1			99			
Benefin	1.6	0.3	1.39	2.2	100				100				
EPTC	11.0	2.4	2.35	25.8	78	22			93	7			
Metribuzin	1.4	0.3	0.95	1.3	67	33				100			
Profluralin	2.6	0.6	2.30	6.0	100					100			
Pronamide	10.8	2.4	1.04	11.2	80	20				100			
Simazine	14.0	3.1	0.89	12.5	85	15				100			
INSECTICIDE:													
Azinphosmethyl	1.7	0.4	0.41	0.7	100					100			
Carbaryl	47.4	10.5	0.89	42.2	58	42	4	2		94			
Carbofuran	3.8	0.8	0.79	3.0	88	12	12			88			
Diazinon & Methoxychlor	5.3	1.2	0.93	4.9	94	6		1		100			
Dimethoate	124.9	27.8	0.42	52.5	89	11				99			
Malathion	9.8	2.2	1.03	10.1	100					100			
Malathion & Methoxychlor	9.6	2.1	1.30	12.5	100					100			
Methidathion	27.4	6.1	0.50	13.7	71	29		5		95			
Methomyl	a					100				100			
Methoxychlor	22.5	5.0	0.65	14.6	63	37	37			63			
Methyl Parathion	6.4	1.4	0.41	2.6	100					100			
Parathion	13.6	3.0	0.40	5.4	100					100			
Phosmet	0.8	0.2	0.98	0.8	100					100			

PESTICIDE	Acres		Quantity Applied Active Ingredient		Application								
					Applicator		Aerial		Ground				
	Treated (000)	Percent of Planted	Per Acre	Total (000)	Self	Commercial	Airplane	Helicopter	Broadcast Incorporated	Broadcast not incor.	Band	Row With Seed	Spot
			(Pounds)		(Percent)		(Percent)		(Percent)				
OTHER HAY (890,000 ACRES)													
HERBICIDES:													
2,4-D	6.5	0.8	0.38	2.5	100					78			22
2,4-DB	2.1	0.2	0.88	1.3	72	28				100			
Dicamba	5.3	0.6	0.45	2.4	100					80			20
INSECTICIDES:													
Azinphosmethyl	a	b								100			
Carbaryl	4.7	0.6	1.22	5.7	100	50				100			
Dimethoate	3.9	0.5	0.36	1.4	50	12				100			
Malathion	5.3	0.6	0.50	2.6	88	100				100			
Parathion	1.9	0.2	0.29	0.6	100					100			
PASTURE (2,400,000 ACRES)													
HERBICIDES:													
2,4-D	41.8	1.7	1.57	65.6	100					93			7
Dicamba	14.8	0.6	0.53	7.8	92	8				9			91
Glyphosate	3.6	0.2	1.67	6.0	100					26			74
Paraquat	5.6	0.2	0.42	2.4	100					48			52
Picloram	108.0	4.5	2.32	250.6	100					14			86
INSECTICIDES:													
Parathion	0.5	b	0.50	0.3	100					100			
TOBACCO (14,400 ACRES)													
HERBICIDES:													
Benefin	2.4	16.7	1.56	3.7	100				52	48			
Diphenamide	2.1	14.6	2.71	5.7	72	28			71	25	4		
Isopropalin	a				100				100				
Metolachlor	a				100				100				
Pebulate	1.6	16.0	3.62	5.8	100			4	64	32			
Pendimethalin	3.8	26.4	1.75	6.7	81	19			90	10			
INSECTICIDES:													
Acephate	2.1	14.6	0.86	1.8	62	38				43	43	7	7
Carbaryl	1.7	11.8	1.07	1.8	100					86	14		
Carbofuran	1.7	11.8	1.83	3.1	29	71			100				
Diazinon	1.9	13.2	1.60	3.0	79	21		8	34	10		48	
Dimethoate	a				100								100
Disulfoton	0.5	3.5	3.87	1.9	100				100				
Malathion	0.5	3.5	1.27	0.6	100					81			19
FUNGICIDES:													
Metalaxyl	6.8	47.2	1.23	8.4	96	4			74	18		5	3
OTHER CONTROL:													
Maleic Hydrazide	7.3	50.7	3.44	25.1	65	35				70	13		17

a - Acreage and rate of application not published when amount treated is less than 500 acres.
b - Less than 1/10 of 1 percent.
c - No data reported.

TABLE 11. HERBICIDE USAGE BY CROP AND PESTICIDE, RATE OF APPLICATION, AND POUNDS OF ACTIVE INGREDIENTS, OHIO 1982*

CROP	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lbs)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)
	2,4-D			2,4-DB			ACTIFLUORFEN		
Corn	544.3	0.48	261.3						
Soybeans				29.7	0.30	8.9	156.1	0.58	90.5
Wheat	67.2	0.54	36.3						
Oats	72.4	0.62	44.9	3.2	0.68	2.2			
Alfalfa Hay				11.1	1.03	11.4			
Other Hay	6.5	0.38	2.5	2.1	0.88	1.8			
Pasture	41.8	1.57	65.6						
Tobacco									
Totals	732.2	0.56	410.6	46.1	0.53	24.3	156.1	0.58	90.5
	ALACHLOR			ATRAZINE			BENEFIN		
Corn	1,641.8	2.01	3,299.6	3,520.8	1.51	5,316.4			
Soybeans	1,768.8	2.04	3,608.4						
Wheat									
Oats									
Alfalfa Hay							1.6	1.39	2.2
Other Hay									
Pasture									
Tobacco							2.4	1.56	3.7
Totals	3,410.4	2.03	6,908.0	3,520.8	1.51	5,316.4	4.0	1.48	5.9
	BENTAZON			BIFENOX			BUTYLATE		
Corn	8.6	0.94	8.1				518.4	3.59	1,861.1
Soybeans	349.3	0.98	342.3	37.2	0.99	36.8			
Wheat									
Oats									
Alfalfa Hay									
Other Hay									
Pasture									
Tobacco									
Totals	357.9	0.98	350.4	37.2	0.99	36.8	518.4	3.59	1,861.1
	CHLORAMBEN			CHLORBROMURON			CYANAZINE		
Corn							1,153.4	1.73	1,995.4
Soybeans	642.9	1.53	983.6	a					
Wheat									
Oats									
Alfalfa Hay									
Other Hay									
Pasture									
Tobacco									
Totals	642.9	1.53	983.6	a			1,153.4	1.73	1,995.4

TABLE 11. (Continued - Page two)

CROP	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lbs)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)
	DICAMBA			DICLOFOP-METHYL			DINOSEB		
Corn	786.2	0.29	228.0						
Soybeans				11.1	1.00	11.1	3.7	2.02	7.5
Wheat	19.0	0.17	3.2				a		
Oats	19.0	0.30	5.7				a		
Alfalfa Hay									
Other Hay	5.3	0.45	2.4						
Pasture	14.8	0.53	7.8						
Tobacco									
Totals	844.3	0.29	247.1	11.1	1.00	11.1	3.7	2.02	7.5
	DIPHENAMID			ETPC			FLUCHLORALIN		
Corn				95.0	4.37	415.2			
Soybeans							40.9	1.14	46.6
Wheat									
Oats									
Alfalfa Hay				11.0	2.35	25.8			
Other Hay									
Pasture									
Tobacco	2.1	2.71	5.7						
Totals	2.1	2.71	5.7	106.0	4.16	441.0	40.9	1.14	46.6
	GLYPHOSATE			ISOPROPALIN			LINURON		
Corn	30.2	1.46	44.1				17.3	1.04	18.0
Soybeans	37.2	1.19	44.3				1,021.9	0.77	786.9
Wheat	4.6	1.25	5.8						
Oats	a								
Alfalfa Hay									
Other Hay									
Pasture	3.6	1.67	6.0						
Tobacco				a					
Totals	75.6	1.33	100.2	a			1,039.2	0.77	804.9
	MCPA			METOLACHLOR			METRIBUZIN		
Corn				1,244.2	1.99	2,476.0			
Soybeans				1,003.3	1.96	1.966.5	1,950.9	0.50	975.5
Wheat	24.8	0.41	10.2						
Oats	22.0	0.49	10.8						
Alfalfa Hay							1.4	0.95	1.3
Other Hay									
Pasture									
Tobacco				a					
Totals	46.8	0.45	21.0	2,247.5	1.98	4,442.5	1,952.3	0.50	976.8

TABLE 11. (Continued - Page three)

CROP	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lbs)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)
	NAPTALAM			NAPTALAM & DINOSEB			ORYZALIN		
Corn									
Soybeans	11.1	1.65	18.3	81.8	1.45	118.6	7.4	0.99	7.3
Wheat									
Oats									
Alfalfa Hay									
Other Hay									
Pasture									
Tobacco									
Totals	11.1	1.65	18.3	81.8	1.45	118.6	7.4	0.99	7.3
	PARAQUAT			PEBULATE			PENDIMETHALIN		
Corn	254.9	0.41	104.5				8.6	1.56	13.4
Soybeans	37.2	0.44	16.4				59.5	1.13	67.2
Wheat									
Oats									
Alfalfa Hay									
Other Hay									
Pasture	5.6	0.42	2.4						
Tobacco				1.6	3.62	5.8	3.8	1.75	6.7
Totals	297.7	0.41	123.3	1.6	3.62	5.8	71.9	1.21	87.3
	PICLORAM			PROFLURALIN			PRONAMIDE		
Corn									
Soybeans				18.6	1.04	19.3			
Wheat									
Oats									
Alfalfa Hay				2.6	2.30	6.0	10.8	1.04	11.2
Other Hay									
Pasture	108.0	2.32	250.6						
Tobacco									
Totals	108.0	2.32	250.6	21.2	1.19	25.3	10.8	1.04	11.2
	PROPACHLOR			SETHOXYDIN			SIMAZINE		
Corn	4.3	2.20	9.5				194.4	1.53	297.4
Soybeans				a					
Wheat									
Oats									
Alfalfa Hay							14.0	0.89	12.5
Other Hay									
Pasture									
Tobacco									
Totals	4.3	2.20	9.5	a			208.4	1.49	309.9

TABLE 11. (Continued - Page four)

CROP	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lbs)
	TRIFLURALIN			VERNOLATE		
Corn						
Soybeans	457.1	1.10	502.8	3.7	2.62	9.7
Wheat						
Oats						
Alfalfa Hay						
Other Hay						
Pasture						
Tobacco						
Totals	457.1	1.10	502.8	3.7	2.62	9.7

* - Includes multiple applications.
a - Acreage and rate of application not published if less than 500 acres treated.

TABLE 12. INSECTICIDE USAGE BY CROP AND PESTICIDE, RATE OF APPLICATION, AND POUNDS OF ACTIVE INGREDIENTS, OHIO 1982*

CROP	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lbs)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)
	ACEPHATE			AZINPHOSMETHYL			CARBARYL		
Corn							24.4	1.08	26.4
Soybeans	a						26.6	1.08	93.5
Wheat							1.1	1.60	1.8
Oats							1.0	0.67	0.7
Alfalfa Hay				1.7	0.41	0.7	47.4	0.89	42.2
Other Hay				a			4.7	1.22	5.7
Pasture									
Tobacco	2.1	0.86	1.8				1.7	1.07	1.8
Totals	2.1	0.86	1.8	1.7	0.53	0.7	166.9	1.03	172.1
	CARBOFURAN			CARBOPHENOTHION			CHLORPYRIFOS		
Corn	484.8	1.13	547.8				144.7	1.05	151.9
Soybeans				a					
Wheat									
Oats									
Alfalfa Hay	3.8	0.79	2.0						
Other Hay									
Pasture									
Tobacco	1.7	1.83	3.1						
Totals	490.3	1.13	553.9	a			144.7	1.05	151.9
	DIAZINON			DIAZINON & METHOXYCHLOR			DIMETHOATE		
Corn	39.5	0.80	31.6				5.6	0.50	2.8
Soybeans	11.2	1.57	17.6				4.3	0.44	1.9
Wheat									
Oats							a		
Alfalfa Hay				5.3	0.93	4.9	124.9	0.42	52.5
Other Hay							3.9	0.36	1.4
Pasture									
Tobacco	1.9	1.60	3.0				a		
Totals	52.6	0.99	52.2	5.3	0.93	4.9	138.7	0.42	58.6
	DISFULFOTON			FENVALERATE			FONOFOS		
Corn	1.9	0.90	1.7				582.5	1.16	675.7
Soybeans				a					
Wheat									
Oats									
Alfalfa Hay									
Other Hay									
Pasture									
Tobacco	0.5	3.87	1.9						
Totals	2.4	1.50	3.6	a			582.5	1.16	675.7

TABLE 12. (Continued - Page two)

CROP	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lbs)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)
	ISOFENPHOS			LINDANE			MALATHION		
Corn	52.6	1.32	69.4	112.7	0.45	50.7			
Soybeans				15.6	0.15	2.3	6.0	1.50	9.0
Wheat				a			1.1	0.75	0.8
Oats							a		
Alfalfa Hay							9.8	1.03	10.1
Other Hay							5.3	0.50	2.6
Pasture									
Tobacco							0.5	1.27	0.6
Totals	52.6	1.32	69.4	128.3	0.41	53.0	22.7	1.02	23.1
	MALATHION & METHOXYCHLOR			METHIDATHION			METHIOCARB		
Corn							a		
Soybeans									
Wheat									
Oats									
Alfalfa Hay	9.6	1.30	12.5	27.4	0.50	13.7			
Other Hay									
Pasture									
Tobacco									
Totals	9.6	1.30	12.5	27.4	0.50	13.7	a		
	METHOMYL			METHOXYCHLOR			METHYL PARATHION		
Corn	3.8	0.45	1.7						
Soybeans									
Wheat									
Oats									
Alfalfa Hay				32.5	0.65	14.6	6.4	0.41	2.6
Other Hay									
Pasture									
Tobacco									
Totals	3.8	0.45	1.7	32.5	0.65	14.6	6.4	0.41	2.6
	OXYDEMETONMETHYL			PARATHION			PHORATE		
Corn	3.8	0.50	1.9				37.6	1.34	50.4
Soybeans				0.9	1.50	1.4	0.7	1.50	1.1
Wheat									
Oats									
Alfalfa Hay				13.6	0.40	5.4			
Other Hay				1.9	0.29	0.6			
Pasture				0.5	0.50	0.3			
Tobacco									
Totals	3.8	0.50	1.9	16.9	0.46	7.7	38.3	1.34	51.5

TABLE 12. (Continued - Page three)

CROP	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lbs)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)
	PHOSMET			PROPHOS			TERBUFOS		
Corn				13.2	0.90	11.9	479.9	1.35	672.2
Soybeans									
Wheat									
Oats									
Alfalfa Hay	0.8	0.98	0.8						
Other Hay									
Pasture									
Tobacco									
Totals	0.8	0.98	0.8	13.2	0.90	11.9	479.9	1.35	672.2
	TOXAPHENE			TRICHLORFON					
Corn	39.5	1.98	78.2	a					
Soybeans									
Wheat									
Oats									
Alfalfa Hay									
Other Hay									
Pasture									
Tobacco									
Totals	39.5	1.98	78.2	a					

* - Includes multiple applications.
a - Acreage and rate of application not published if less than 500 acres treated.

TABLE 13. FUNGICIDE USAGE BY CROP AND PESTICIDE, RATE OF APPLICATION, AND POUNDS OF ACTIVE INGREDIENTS, OHIO 1982*

CROP	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lbs)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)
	CAPTAN			CARBOXIN			MANCOZEB		
Corn	153.5	0.11	16.9				12.4	0.75	9.3
Soybeans	64.1	0.06	3.8	10.6	0.08	0.8			
Wheat	8.6	0.07	0.6	32.8	0.14	4.6			
Oats	1.3	0.07	0.1	4.6	0.10	0.5			
Alfalfa Hay									
Other Hay									
Pasture									
Tobacco									
Totals	227.5	0.09	21.4	48.0	0.12	5.9	12.4	0.75	9.3
	MANEB			METALAXYL					
Corn									
Soybeans									
Wheat	7.3	0.07	0.5						
Oats									
Alfalfa Hay									
Other Hay									
Pasture									
Tobacco				6.8	1.23	8.4			
Totals	7.3	0.07	0.5	6.8	1.23	8.4			

* - Includes multiple applications.

TABLE 14. OTHER PESTICIDE USAGE BY CROP AND PESTICIDE, RATE OF APPLICATION, AND POUNDS OF ACTIVE INGREDIENTS, OHIO 1982*

CROP	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lb)	Acres Treated (1,000 Acres)	Rate Per Acre (lb)	Amount Active of Ingredient (1,000 lbs)
	MALEIC HYDRAZIDE			PARAQUAT (DEFOLIANT)		
Corn						
Soybeans				15.0	0.41	6.2
Wheat						
Oats						
Alfalfa Hay						
Other Hay						
Pasture						
Tobacco	7.3	3.44	25.1			
Totals	7.3	3.44	25.1	15.0	0.41	6.2

* - Includes multiple applications.

TABLE 15. APPLICATOR AND METHOD OF APPLICATION OF 15 MAJOR HERBICIDES, OHIO 1982

HERBICIDE	Applicator		METHOD OF APPLICATION						
			Aerial		Ground				
	Self	Commercial	Airplane	Helicopter	Broadcast Incorporated	Broadcast Not Incorp.	Band	In Furrow With Seed	Spot
	Percent		Percent		Percent				
2,4-D	93	7	1	1	2	81	5		10
Actifluorfen	92	9	1	1	2	64	5		27
Alachlor	79	21		1	17	71	11		
Atrazine	79	21			32	64	4		
Bentazon	92	8		1	1	57	10		31
Butylate	96	4		1	98	1			
Chloramben	93	7		1	22	39	38		
Cyanazine	70	30			29	62	9		
Dicamba	95	5		1	2	75	4		18
Linuron	79	21			11	85	4		
Metolachlor	82	18		1	29	66	4		
Metribuzin	81	19		1	41	53	5		
Paraquat	63	37			5	94			1
Simazine	85	15			17	83			
Trifluralin	80	20		2	96	2			
Major Herbicide Acreage	82	18		1	27	63	7		2
Active Ingredients	81	19		1	31	60	7		1

TABLE 16. APPLICATOR AND METHOD OF APPLICATION OF 15 MAJOR INSECTICIDES, OHIO 1982

INSECTICIDE	Applicator		METHOD OF APPLICATION						
			Aerial		Ground				
	Self	Commercial	Airplane	Helicopter	Broadcast Incorporated	Broadcast Not Incorp.	Band	In Furrow With Seed	Spot
	Percent		Percent		Percent				
Carbaryl	49	51	15	13	2	51	17	2	
Carbofuran	98	2			2	4	57	37	
Chlorpyrifos	100					7	68	25	
Diazinon	99	1			1		5	93	1
Dimethoate	87	13	1	2		96	1		
Fonofos	100				2	4	81	13	
Isophenphos	98	2					72	28	
Lindane	100				1	3	1	93	2
Malathion	60	40				100			
Methidathion	71	19		5		95			
Methyoxychlor	63	37	37			63			
Parathion	92	8		5		95			
Phorate	100					15	78	7	
Terbufos	99	1			1	3	59	37	
Toxaphene	51	49			7	77	16		
Major Herbicide Acreage	93	7	1	1	1	17	52	28	
Active Ingredients	94	6	1	1	1	13	57	27	

TABLE 17. TARGETED CONTROL OF HERBICIDES, BY CROP, OHIO 1982

CORN

PESTICIDE	Acreage Treated	PERCENT OF ACREAGE TREATED FOR CONTROL OF:*										
		Canada Thistle	Cocklebur	Ragweed Common	Ragweed Giant	Fall Panicum	Foxtails	Quackgrass	Yellow Nutsedge	Prevention General Broadleaf Weed	Prevention General Grass Weed	Other /1/
	1,000 ACRES											
2,4-D	544.3	34	11	3	17	b	b	-	-	36	1	53
Alachlor	1,641.6	1	2	2	1	21	48	2	8	10	47	16
Atrazine	3,520.8	4	7	9	6	6	19	7	3	43	23	41
Bentazon	8.6	17	4	-	-	-	-	-	97	-	-	3
Butylate	518.4	-	4	-	1	20	34	8	29	9	44	20
Cyanazine	1,153.4	1	3	8	4	11	22	2	3	48	35	28
Dicamba	786.2	55	7	2	13	b	b	-	b	38	1	52
EPTC	95.0	-	-	-	-	10	14	37	2	1	35	58
Glyphosate	30.2	13	3	4	2	-	-	48	-	32	b	43
Linuron	17.3	-	9	1	-	9	-	-	-	37	30	23
Metolachlor	1,244.2	2	6	4	6	19	34	3	21	21	41	13
Paraquat	254.9	5	-	b	7	6	13	4	-	66	76	5
Pendimethalin	8.6	c	c	c	c	c	c	c	c	c	c	c
Propachlor	4.3	-	-	-	-	-	100	-	-	-	-	-
Simazine	194.4	1	-	3	1	50	45	6	3	18	39	11

SOYBEANS

		Canada Thistle	Cocklebur	Foxtails	Ragweed Common	Ragweed Giant	Jimsonweed	Johnsongrass	Lambsquarter	Smartweed	Prevention General Broadleaf Weed	Prevention General Grass Weed	Other /2/
2,4-DB	29.7	18	14	-	41	28	-	-	-	-	21	-	28
Actifluorfen	156.1	11	21	6	6	16	7	2	14	15	23	3	42
Alachlor	1,768.8	1	3	39	3	2	1	1	1	2	17	55	31
Bentazon	349.3	34	36	1	10	14	10	b	2	4	30	2	22
Bifenox	37.2	-	-	5	6	9	-	-	12	6	69	20	31
Chloramben	642.9	1	3	22	8	1	1	1	6	11	51	34	41
Chlorbromuron	a	-	-	-	100	100	-	-	-	-	-	-	-
Diclofop-Methyl	11.1	-	-	60	5	-	-	-	-	-	20	34	-
Dinoseb	3.7	-	33	-	-	-	-	-	-	-	67	-	80
Fluchloralin	40.9	-	-	44	1	3	6	21	19	-	8	48	1
Glyphosate	37.2	37	2	2	1	27	10	2	5	-	b	4	48
Linuron	1,021.9	1	3	8	12	5	1	1	9	7	62	16	21
Metolachlor	1,003.3	1	2	40	4	1	12	1	1	2	10	52	37
Metribuzin	1,950.9	3	14	5	7	6	-	b	7	11	56	12	19
Naptalam	11.1	-	-	-	-	53	19	-	-	-	-	-	47
Naptalam & Dinoseb	81.8	26	62	2	8	14	-	-	-	-	12	3	31
Oryzalin	7.4	-	-	32	-	-	5	30	-	-	15	57	-
Paraquat	37.2	1	-	11	8	1	1	-	2	7	70	79	9
Pendimethalin	59.5	-	1	38	3	b	-	-	20	-	17	53	19
Profluralin	18.6	-	-	77	-	-	-	-	-	24	-	22	56
Sethoxydin	a	-	-	36	-	-	1	8	-	-	-	-	56
Trifluralin	457.1	-	3	43	b	5	-	6	2	1	9	47	27
Vernolate	3.7	-	-	-	-	-	-	100	-	-	-	100	-

TABLE 17. (Continued - Page two)

WHEAT

PESTICIDE	Acreage Treated	PERCENT OF ACREAGE TREATED FOR CONTROL OF:*											
		Bind-weed	Canada Thistle	Cockle-bur	Ragweed Common	Ragweed Giant	Johnson-grass	Morning Glory	Pepper-grass	Smart-Weed	Wild Garlic and Onion	General Broad-leaf Weed Prev.	Other /3/
	1,000 ACRES												
2,4-D	67.2	-	30	2	2	2	-	6	19	1	12	50	30
Dicamba	19.0	-	76	17	-	24	-	-	-	29	2	20	32
Dinoseb	a	-	-	-	-	-	-	-	-	-	-	-	100
Glyphosate	4.6	19	58	-	-	-	41	-	-	-	-	-	18
MCPA	24.8	-	87	10	8	-	-	-	4	-	-	39	3

OATS

		Common Thistle	Cockle-bur	Ragweed Common	Ragweed Giant	Fox-tails	Lambs-quarter	Morning Glory	Smart-Weed	Wild Mustard	Prevention General Broad-leaf Weed	Prevention General Grass Weed	Other /4/
2,4-D	72.4	22	6	16	18	b	14	7	5	11	45	7	2
2,4-DB	3.2	12	-	13	-	-	-	-	-	-	70	-	13
Dicamba	19.0	24	-	20	16	-	6	3	2	-	50	2	11
Dinoseb	a	-	-	-	-	-	-	-	-	-	-	-	100
Glyphosate	a	-	-	-	-	-	-	-	-	-	100	100	-
MCPA	22.0	42	29	14	20	3	1	50	-	4	26	-	-

ALFALFA HAY

		Canada Thistle	Chick-Weed	Crab-grass	Fall Panicum	Fox-tails	Lambs-quarter	Pig-weed	Quack-grass	Smart-weed	Prevention General Broad-leaf Weed	Prevention General Grass Weed	Other /5/
2,4-DB	11.1	11	2	13	-	-	-	13	3	22	61	1	16
Benefin	1.6	-	-	-	-	-	-	-	-	-	-	100	-
EPTC	11.0	-	4	12	-	5	-	-	-	-	28	79	12
Metribuzin	1.4	-	-	-	-	-	-	-	-	-	44	44	56
Profluralin	2.6	-	-	-	-	57	100	-	-	43	-	-	-
Pronamide	10.8	-	26	21	-	-	-	-	47	-	19	23	-
Simazine	14.0	-	79	-	18	-	-	-	4	-	7	21	7

OTHER HAY

		Canada Thistle	Morning Glory	Multiflora Rose	Gen. Broadleaf Weed Prevention	Gen. Grass Weed Prevention	Bindweed
2,4-D	6.5	8	40	8	52	9	-
2,4-DB	2.1	-	-	-	73	-	27
Dicamba	5.3	20	89	-	36	35	-

TABLE 17. (Continued - Page three)

PASTURE

PESTICIDE	Acreage Treated	PERCENT OF ACREAGE TREATED FOR CONTROL OF:*											
		Canada Thistle	Dande-lion-	Johnson-grass	Mutli-flora Rose	Night Shade	Quack-grass	Smart-weed	Tall Iron-weed	Velvet Leaf	Prevention General Broad-leaf Weed	Prevention General Grass Weed	Other /6/
	1,000 ACRES												
2,4-D	41.8	7	11	-	6	-	-	-	4	2	54	19	
Dicamba	14.8	13	2	-	71	9	-	3	-	-	12	-	5
Glyphosate	3.6	7	-	22	50	-	11	-	-	-	-	10	-
Paraquat	5.6	-	-	-	47	-	-	-	-	-	15	53	
Picloram	108.0	-	-	-	100	-	-	-	-	-	b	-	-

TOBACCO

		Ragweed Common	Ragweed Giant	Fox-tails	Crab-grass	Johnson-grass	Lambs-quarter	Morning Glory	Pig-weed	Yellow Nutsedge	Prevention General Broad-leaf Weed	Prevention General Grass Weed	Other /7/
Benefin	2.4	16	14	24	-	-	21	2	43	-	15	28	7
Diphenamid	2.1	5	-	47	4	20	26	-	12	-	21	35	5
Isopropalin	a	-	-	-	-	-	-	-	-	-	100	75	
Metolachlor	a	-	-	-	-	-	-	-	-	-	-	100	-
Pebulate	1.6	-	-	18	-	-	-	9	18	9	30	63	37
Pendimethalin	3.8	9	13	17	12	-	3	30	2	9	27	50	-

* - Sum of percents can equal more than 100 because multiple targets per pesticide could be specified.
a - Acreage and control not published if less than 500 acres.
b - Less than 1%.
c - No data reported.
1/ Reports include: Artichoke, Barnyard grass, Bindweed, Chickweed, Climbing Milkweed, Crabgrass, Dandelion, Jimsonweed, Johnson grass, Lambsquarter, Morning Glory, Multiflora Rose, Nightshade, Peppergrass, Pigweed, Smartweed, Tall Ironweed, Velvet Leaf, Wild Cucumber, Wild Garlic, Wild Mustard, Yellow Rocket.
2/ Reports included: Artichoke, Barnyard grass, Bindweed, Chickweed, Climbing Milkweed, Crabgrass, Fall Panicum, Morning Glory, Multiflora Rose, Nightshade, Peppergrass, Quackgrass, Tall Ironweed, Velvet Leaf, Wild Cucumber, Wild Mustard, Yellow Nutsedge, Yellow Rocket.
3/ Reports included: Chickweed, General Grass Weed Prevention, Lambsquarter, Multiflora Rose, Quackgrass, Wild Mustard, Yellow Rocket.
4/ Reports included: Chickweed, Climbing Milkweed, Pigweed, Quackgrass, Velvet Leaf, Wild Garlic/Onions, Yellow Nutsedge, Yellow Rocket.
5/ Reports included: Barnyard Grass, Cocklebur, Common Ragweed, Dandelions, Wild Mustard, Yellow Rocket.
6/ Reports included: Climbing Milkweed, Giant Ragweed.
7/ Reports included: Canada Thistle, Cocklebur, Jimsonweed, Smartweed.

TABLE 18. TARGETED CONTROL OF INSECTICIDES, BY CROP, OHIO 1982

CORN

PESTICIDE	Acreage Treated	PERCENT OF ACREAGE TREATED FOR CONTROL OF: *									
		Army-worm	Common Stalk Borer	Corn Root-worm	Cut-Worm	European Corn Borer	Japanese Beetle	Seed Corn Maggot	Seed Corn Beetle	Wire-Worm	Other /1/
	1000 ACRES										
Carbaryl	24.4	16	-	63	9	15	19	-	-	-	6
Carbofuran	484.8	7	6	88	23	15	-	5	3	5	11
Chlorpyrifos	144.7	2	2	81	68	6	-	5	3	5	2
Diazinon	39.5	-	-	3	15	-	-	76	40	33	-
Dimethoate	5.6	c	c	c	c	c	c	c	c	c	c
Disulfoton	1.9	-	-	-	100	-	-	-	-	-	-
Fonofos	582.5	6	10	77	42	7	-	2	-	12	5
Isofenphos	52.6	-	3	95	26	5	-	6	-	8	7
Lindane	112.7	-	-	5	9	-	-	59	22	55	2
Methiocarb	a	c	c	c	c	c	c	c	c	c	c
Methomyl	3.8	c	c	c	c	c	c	c	c	c	c
Oxydemetonmethyl	3.8	c	c	c	c	c	c	c	c	c	c
Phorate	37.6	-	7	95	49	6	-	2	-	1	-
Prophos	13.2	33	10	100	3	-	-	-	-	-	-
Terbufos	497.9	3	3	78	19	8	-	4	-	18	17
Toxaphene	39.5	68	-	2	84	-	-	1	-	-	6
Trichlorfon	a	100	-	-	100	-	-	-	-	-	-

SOYBEANS

		Bean Leaf Beetle	Greenbug	Hessian Fly	Japanese Beetle	Mexican Bean Beetle	Nematodes	Seed Corn Maggot	Wireworms
Acephate	a	-	-	-	100	100	-	-	-
Carbaryl	86.6	36	b	12	24	58	-	-	-
Carbophenothion	a	100	-	-	-	100	-	-	-
Diazinon	11.2	-	-	-	-	-	61	100	-
Dimethoate	4.3	12	-	-	47	100	-	-	-
Fenvalerate	a	-	-	-	-	100	-	-	-
Lindane	15.6	-	-	-	-	-	64	75	25
Malathion	6.0	c	c	c	c	c	c	c	c
Parathion	0.9	100	-	-	-	100	-	-	-
Phorate	0.7	-	-	-	-	-	-	-	-

WHEAT

		Armyworms	Cereal Leaf Beetle	Other
Carbaryl	1.1	96	4	-
Lindane	a	c	c	c
Malathion	1.1	c	c	c

OATS

		Cereal Leaf Beetle	Potato Leafhopper	Other
Carbaryl	1.0	36	64	-
Dimethoate	a	-	100	-
Malathion	a	100	-	-
Toxaphene	a	c	c	c

TABLE 18. (Continued - Page two)

ALFALFA HAY

PESTICIDE	Acreage Treated	PERCENT OF ACREAGE TREATED FOR CONTROL OF:*							
		Aphids	Alfalfa Blotch Leafminer	Alfalfa Weevil	Bean Leaf Beetle	Grasshopper	Mexican Bean Beetle	Potato Leaf-hopper	Spittlebug
	1,000 ACRES								
Azinphosmethyl	1.7	-	-	73	-	-	-	100	-
Carbaryl	47.4	4	-	36	2	2	6	66	b
Carbofuran	3.8	32	17	70	-	-	-	47	-
Diazinon & Methoxychlor	5.3	-	-	73	-	-	-	71	-
Dimethoate	124.9	4	2	9	-	2	2	96	7
Malathion	9.8	-	-	64	-	-	-	50	8
Malathion & Methoxychlor	9.6	-	-	68	-	8	-	65	1
Methidathion	27.4	-	-	36	-	-	5	85	5
Methomyl	a	-	-	-	-	-	-	100	-
Methoxychlor	22.5	-	-	41	-	-	10	100	-
Methyl Parathion	6.4	44	-	56	-	-	-	83	2
Parathion	13.6	44	-	66	-	17	-	56	-
Phosmet	0.8	-	76	100	-	-	-	16	-

OTHER HAY

		Alfalfa Blotch Leafminer	Alfalfa Weevil	Grasshopper	Mexican Bean Beetle	Potato Leafhopper	Spittlebug
Azinphosmethyl	a	-	100	-	-	100	-
Carbaryl	4.7	-	57	-	6	37	72
Dimethoate	3.9	2	36	-	-	98	2
Malathion	5.3	c	c	c	c	c	c
Parathion	1.9	-	-	100	-	-	100

PASTURE

		Potato Leafhopper	Other
Parathion	0.5	100	-

TOBACCO

		Aphids	Budworm	Cutworm	Flea Beetle	Hornworm	Wireworm
Acephate	2.1	54	23	10	27	25	-
Carbaryl	1.7	39	7	57	41	20	-
Carbofuran	1.7	-	-	57	65	2	22
Diazinon	1.9	-	-	87	40	9	51
Dimethoate	a	-	-	100	100	-	-
Disulfoton /2/	0.5	-	-	-	100	-	-
Malathion	0.5	-	100	-	-	-	-

* - Sum of percents can equal more than 100 because multiple targets per pesticide could be specified.
a - Acreage not published if less than 500 acres. Control target reflects use on limited acreage reported only.
b - Less than 1%.
c - No data reported.
1/ Reports included: Cereal Leaf Beetle, Chinch Bug, Corn Leaf Aphid, Fall Armyworm, Flea Beetle, Grasshopper, Mexican Bean Beetle, Nematodes, Slugs, Sod Webworm, Symphylan, White Grubs.
2/ Also reported 1% for control of nematodes.

TABLE 19. TARGETED CONTROL OF FUNGICIDES, BY CROP, OHIO 1982

CORN

PESTICIDE	Acreage Treated	PERCENT OF ACREAGE TREATED FOR CONTROL OF: *					
		Bacterial Leaf Blight	Gibberella Ear Rot	Gibberella Stalk Rot	Northern Corn Blight	Seed Decay and Mold	Other
	1,000 ACRES						
Captan	153.5	-	-	-	37	63	-
Mancozeb	12.4	37	63	63	-	-	-

SOYBEANS

		Downy Mildew	Fusarium Stem & Root Rot	Pythium Stem & Root Rot	Seed Decay & Mold	Other
Captan	64.1	12	-	-	100	-
Carboxin	10.6	-	14	14	86	-

WHEAT

		Leaf Rust	Loose Smut	Soil Borne Mosaic	Stinking Smut or Bunt	Wheat Streak Mosaic	Seed Decay & Other Mold
Captan	8.6	20	36	35	32	-	9
Carboxin	32.8	-	100	-	70	25	-
Maneb	7.3	-	29	-	100	-	-

OATS

		Loose Smut	Other
Captan	1.3	100	
Carboxin	4.6	100	

* Sum of percents can equal more than 100 because multiple targets per pesticide could be specified.

TABLE 20. CORN ACREAGES AND PERCENTS OF LAND TREATED WITH PESTICIDES BY REGIONS, OHIO 1982*

Region & State	Acres Planted	PERCENT OF PLANTED ACREAGE TREATED FOR CONTROL OF:			PLANTED ACREAGE TREATED FOR CONTROL OF:		
		Weeds	Insects	Disease and Other Control	Weeds	Insects	Disease and Other Control
	1,000 Acres	Percent			1,000 Acres		
Northwest	780.0	99.4	36.8	2.2	775.3	287.0	17.2
North Central	540.0	99.6	41.3	5.8	537.8	223.0	31.3
Northeast	350.0	99.2	49.2	5.2	347.2	172.2	18.2
West Central	780.0	99.5	45.7	2.6	776.1	356.5	20.3
Central	900.0	99.0	37.6	3.6	891.0	338.4	32.4
East Central	170.0	99.0	59.1	8.5	168.3	100.5	14.5
Southwest	460.0	99.7	59.8	3.2	458.6	275.1	14.7
South Central	250.0	98.3	27.0	5.1	245.8	67.5	12.8
Southeast	120.0	99.3	48.1	3.2	119.2	57.7	3.8
Ohio	4,350.0	99.3	43.2	3.8	4,320.0	1,879.0	165.0

* - Acreages receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio total percents and acreages were weighed computations using district planted acreages as weights. Therefore, district acreages may not add to the Ohio total.

TABLE 21. SOYBEANS ACREAGES AND PERCENTS OF LAND TREATED WITH PESTICIDES BY REGIONS, OHIO 1982*

Region & State	Acres Planted	PERCENT OF PLANTED ACREAGE TREATED FOR CONTROL OF:			PLANTED ACREAGE TREATED FOR CONTROL OF:		
		Weeds	Insects	Disease and Other Control	Weeds	Insects	Disease and Other Control
	1,000 Acres	Percent			1,000 Acres		
Northwest	1,053.0	98.3	1.4	2.4	1,035.1	14.7	25.3
North Central	660.0	99.4	1.1	1.5	656.0	7.3	9.9
Northeast	110.0	99.3	0.5	5.5	109.2	0.6	6.1
West Central	680.0	99.5	3.0	1.5	676.6	20.4	10.2
Central	755.0	99.4	4.2	3.4	750.5	31.7	25.7
East Central	6.5	92.9	28.3	a	6.0	1.8	a
Southwest	330.0	99.5	9.3	3.1	328.4	30.7	10.2
South Central	150.0	98.1	9.9	3.4	147.2	14.9	5.1
Southeast	5.5	100.0	-	-	5.5	-	-
Ohio	3,750.0	99.1	3.3	2.4	3,716.0	124.0	90.0

* - Acreages receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio total percents and acreages were weighed computations using district planted acreages as weights. Therefore, district acreages may not add to the Ohio total.

a - District data not shown when amount treated is less than 500 acres, but are included in State totals.

TABLE 22. WHEAT ACREAGES AND PERCENTS OF LAND TREATED WITH PESTICIDES BY REGIONS, OHIO 1982*

Region & State	Acres Planted	PERCENT OF PLANTED ACREAGE TREATED FOR CONTROL OF:			PLANTED ACREAGE TREATED FOR CONTROL OF:		
		Weeds	Insects	Disease and Other Control	Weeds	Insects	Disease and Other Control
	1,000 Acres	Percent			1,000 Acres		
Northwest	489.2	7.6	0.4	8.2	37.2	2.0	40.1
North Central	267.6	4.1	a	5.4	11.0	a	14.4
Northeast	50.6	8.8	-	4.9	4.5	-	2.5
West Central	267.8	15.3	0.2	1.5	41.0	0.5	4.0
Central	260.0	2.1	0.7	2.6	5.5	1.8	6.8
East Central	11.9	a	-	a	a	-	a
Southwest	89.7	6.3	-	0.9	5.7	-	0.8
South Central	51.0	5.4	2.2	4.1	2.8	1.1	2.1
Southeast	12.2	a	a	a	a	a	a
Ohio	1,500.0	7.2	0.4	4.7	108.0	6.0	70.0

* - Acreages receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio total percents and acreages were weighed computations using district planted acreages as weights. Therefore, district acreages may not add to the Ohio total.

a - District data not shown when amount treated is less than 500 acres, but are included in State totals.

TABLE 23. OATS ACREAGES AND PERCENTS OF LAND TREATED WITH PESTICIDES BY REGIONS, OHIO 1982*

Region & State	Acres Planted /1/	PERCENT OF PLANTED ACREAGE TREATED FOR CONTROL OF:			PLANTED ACREAGE TREATED FOR CONTROL OF:		
		Weeds	Insects	Disease and Other Control	Weeds	Insects	Disease and Other Control
	1,000 Acres	Percent			1,000 Acres		
Northwest	80.5	21.8	a	5.0	17.5	a	4.0
North Central	65.9	47.5	-	1.1	31.3	-	0.7
Northeast	77.1	51.8	1.0	3.6	39.9	0.8	2.8
West Central	67.1	22.2	-	0.9	14.9	-	0.6
Central	33.5	12.3	a	3.3	4.1	a	1.1
East Central	31.3	21.1	a	1.5	6.6	a	0.5
Southwest	7.8	6.0	a	-	0.5	0.1	-
South Central	5.6	-	-	-	-	-	-
Southeast	11.2	10.1	a	-	1.1	a	-
Ohio	380.0	30.5	0.6	2.6	116.0	2.0	10.0

* - Acreages receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio total percents and acreages were weighed computations using district planted acreages as weights. Therefore, district acreages may not add to the Ohio total.

a - District data not shown when amount treated is less than 500 acres, but are included in State totals.

/1/ Regional planted acres were not official SRS estimates.

TABLE 24. ALFALFA HAY ACREAGES AND PERCENTS OF LAND TREATED WITH PESTICIDES BY REGIONS, OHIO 1982*

Region & State	Acres Planted /1/	PERCENT OF PLANTED ACREAGE TREATED FOR CONTROL OF:			PLANTED ACREAGE TREATED FOR CONTROL OF:		
		Weeds	Insects	Disease and Other Control	Weeds	Insects	Disease and Other Control
	1,000 Acres	Percent			1,000 Acres		
Northwest	42.0	13.8	39.7	a	5.8	16.7	a
North Central	62.0	10.8	45.0	-	6.7	27.9	-
Northeast	100.0	19.7	53.8	a	19.7	53.8	a
West Central	81.0	11.1	37.2	-	9.0	30.1	-
Central	49.0	7.2	33.3	-	3.5	16.3	-
East Central	64.0	5.9	45.8	-	3.8	29.3	-
Southwest	26.0	10.7	31.5	-	2.8	8.2	-
South Central	6.0	a	9.8	-	a	0.6	-
Southeast	20.0	4.7	30.7	-	0.9	6.1	-
Ohio	450.0	11.7	42.0	0.2	53.0	189.0	1.0

* - Acreages receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio total percents and acreages were weighed computations using district planted acreages as weights. Therefore, district acreages may not add to the Ohio total.

a - District data not shown when amount treated is less than 500 acres, but are included in State totals.

/1/ Unofficial regional acreages harvested.

TABLE 25. OTHER HAY ACREAGES AND PERCENTS OF LAND TREATED WITH PESTICIDES BY REGIONS, OHIO 1982*

Region & State	Acres Planted /1/	PERCENT OF PLANTED ACREAGE TREATED FOR CONTROL OF:			PLANTED ACREAGE TREATED FOR CONTROL OF:		
		Weeds	Insects	Disease and Other Control	Weeds	Insects	Disease and Other Control
	1,000 Acres	Percent			1,000 Acres		
Northwest	24.0	-	-	-	-	-	-
North Central	40.0	a	2.6	-	a	1.0	-
Northeast	140.0	1.5	4.8	-	2.1	6.7	-
West Central	36.0	-	4.4	-	-	1.6	-
Central	99.0	3.6	0.9	-	3.6	0.9	-
East Central	136.0	a	1.6	-	a	2.2	-
Southwest	51.0	1.9	-	-	1.0	-	-
South Central	124.0	1.6	0.4	-	2.0	0.5	-
Southeast	200.0	1.1	0.8	-	2.2	1.6	-
Ohio	850.0	1.3	1.7	-	11.0	14.0	-

* - Acreages receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio total percents and acreages were weighed computations using district planted acreages as weights. Therefore, district acreages may not add to the Ohio total.

a - District data not shown when amount treated is less than 500 acres, but are included in State totals.

/1/ Unofficial regional acreages harvested.

TABLE 26. PASTURE ACREAGES AND PERCENTS OF LAND TREATED WITH PESTICIDES BY REGIONS, OHIO 1982*

Region & State	Acres Planted	PERCENT OF PLANTED ACREAGE TREATED FOR CONTROL OF:			PLANTED ACREAGE TREATED FOR CONTROL OF:		
		Weeds	Insects	Disease and Other Control	Weeds	Insects	Disease and Other Control
	1,000 Acres	Percent			1,000 Acres		
Northwest	64.0	2.7	a	-	1.7	a	-
North Central	120.0	6.6	-	-	7.9	-	-
Northeast	233.0	3.8	2.3	-	8.9	5.4	-
West Central	163.0	5.0	-	-	8.2	-	-
Central	370.0	5.0	-	-	18.5	-	-
East Central	355.0	6.7	-	-	23.8	-	-
Southwest	183.0	3.6	-	-	6.6	-	-
South Central	350.0	6.9	-	-	24.2	-	-
Southeast	562.0	7.8	-	-	43.8	-	-
Ohio	2,400.0	6.0	0.2	-	144.0	5.0	-

* - Acreages receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio total percents and acreages were weighed computations using district planted acreages as weights. Therefore, district acreages may not add to the Ohio total.

a - District data not shown when amount treated is less than 500 acres, but are included in State totals.

TABLE 27. TOBACCO ACREAGES AND PERCENTS OF LAND TREATED WITH PESTICIDES BY REGIONS, OHIO 1982*

Region & State	Acres Planted /1/	PERCENT OF PLANTED ACREAGE TREATED FOR CONTROL OF:			PLANTED ACREAGE TREATED FOR CONTROL OF:		
		Weeds	Insects	Disease and Other Control	Weeds	Insects	Disease and Other Control
	1,000 Acres	Percent			1,000 Acres		
Northwest	-	-	-	-	-	-	-
North Central	-	-	-	-	-	-	-
Northeast	-	-	-	-	-	-	-
West Central	1.2	72.8	81.6	a	0.9	1.0	a
Central	0.1	a	a	-	a	a	-
East Central	-	-	-	-	-	-	-
Southwest	1.8	73.8	50.1	59.8	1.3	1.6	1.1
South Central	11.3	74.3	48.1	60.6	8.4	5.4	6.8
Southeast	-	-	-	-	-	-	-
Ohio	14.4	73.5	50.8	60.6	10.6	7.3	8.7

* - Acreages receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio total percents and acreages were weighed computations using district planted acreages as weights. Therefore, district acreages may not add to the Ohio total.

a - District data not shown when amount treated is less than 500 acres, but are included in State totals.

/1/ Unofficial regional acreages harvested.

TABLE 28. CORN ACREAGES TREATED BY REGIONS AND PESTICIDE, OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	1,000 Acres									
HERBICIDES:										
2,4-D	200.0	51.6	12.2	118.7	105.1	11.3	15.6	15.2	13.0	544.3
Alachlor	305.4	286.6	81.6	366.3	306.5	25.4	149.5	81.1	41.1	1641.6
Atrazine	495.4	450.7	321.5	641.1	719.0	156.7	416.4	223.2	96.4	3520.8
Bentazon	3.9	1.1	a	a	0.9	a	-	-	-	8.6
Butylate	74.4	30.7	5.9	41.9	190.7	17.8	112.4	32.2	11.8	518.4
Cyanazine	287.6	183.9	56.9	237.5	198.7	33.2	77.0	60.7	16.4	1153.4
Dicamba	200.0	76.4	16.7	215.8	204.9	19.7	23.4	12.5	18.7	786.2
EPTC	8.5	2.7	13.5	38.0	5.3	3.5	4.1	10.3	9.4	95.0
Glyphosate	6.2	1.1	2.1	1.6	0.9	8.8	2.3	a	7.9	30.2
Linuron	0.8	1.6	0.7	0.8	7.1	a	1.8	4.2	a	17.3
Metolachlor	190.7	143.6	189.9	248.4	221.0	53.9	125.7	41.0	31.3	1244.2
Paraquat	4.7	39.8	35.8	18.6	64.2	32.8	19.7	18.9	18.2	254.9
Pendimethalin	4.7	1.6	-	1.6	-	-	-	-	-	8.6
Propachlor	-	-	-	-	4.3	-	-	-	-	4.3
Simazine	17.8	20.4	22.2	12.4	21.4	36.0	25.2	27.4	13.6	194.4
INSECTICIDES:										
Carbaryl	3.2	5.6	0.9	3.9	7.1	1.1	1.1	1.2	a	24.4
Carbofuran	70.9	64.2	49.2	86.6	74.8	35.2	46.2	30.1	19.4	484.8
Chlorpyrifos	0.9	30.8	26.0	21.7	35.5	9.2	19.8	3.6	-	144.7
Diazinon	9.8	13.6	3.3	3.9	3.4	1.8	a	0.6	0.5	39.5
Dimethoate	-	-	-	5.6	-	-	-	-	-	5.6
Disulfoton	-	-	0.9	0.8	-	-	-	-	-	1.9
Fonofos	97.0	58.4	35.5	148.7	101.5	26.5	110.0	10.0	5.4	582.5
Isofenphos	11.8	6.7	11.0	12.8	4.7	a	5.5	-	-	52.6
Lindane	16.4	21.2	12.7	3.6	17.9	9.1	11.0	12.0	1.7	112.7
Methiocarb	-	-	-	-	-	-	a	-	a	a
Methomyl	-	-	-	-	3.8	-	-	-	-	3.8
Oxydemetonmethyl	-	3.8	-	-	-	-	-	-	-	3.8
Phorate	4.9	-	5.2	10.0	2.7	2.5	8.0	-	7.5	37.6
Prophos	1.6	0.9	-	-	2.7	-	9.6	a	-	13.2
Terbufos	97.3	51.3	40.0	88.4	92.0	20.9	64.9	14.1	22.8	497.9
Toxaphene	0.9	7.4	1.9	4.3	16.2	5.2	1.7	-	0.6	39.5
Trichlorfon	-	-	a	-	-	-	-	-	-	a
FUNGICIDES:										
Captan	16.8	31.3	18.0	15.9	31.7	12.9	12.4	12.8	3.8	153.5
Mancozeb	0.9	-	-	-	-	-	9.2	-	-	12.4

* - Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - District data not published when less than 500 acres treated.

TABLE 29. SOYBEAN ACREAGES TREATED BY REGIONS AND PESTICIDE, OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
					1,000 Acres					
HERBICIDES:										
2,4-DB	1.0	2.0	-	2.0	13.5	-	4.6	5.4	-	29.7
Actifluorfen	37.3	13.8	6.6	20.3	54.0	0.5	8.5	15.6	a	156.1
Alachlor	363.3	436.2	46.8	326.8	340.7	1.5	151.4	97.3	3.6	1768.8
Bentazon	118.0	58.4	9.2	54.1	79.6	2.2	15.8	11.8	a	349.3
Bifenox	11.4	6.6	a	7.4	11.3	-	a	-	-	37.2
Chloramben	429.6	75.4	1.1	44.7	68.3	-	11.5	6.6	1.1	642.9
Chlorbromuron	-	a	-	-	-	-	-	-	-	a
Diclofop-Methyl	6.2	2.0	-	2.0	0.8	-	-	1.8	-	11.1
Dinoseb	-	-	-	1.4	-	-	1.6	-	-	3.7
Fluchloralin	9.3	-	-	10.1	15.8	-	0.7	6.5	-	40.9
Glyphosate	5.2	3.9	3.2	2.7	15.0	-	2.3	4.3	1.2	37.2
Linuron	86.9	258.5	66.2	163.1	213.1	0.7	142.9	90.4	2.3	1021.9
Metolachlor	221.5	169.9	58.4	205.7	190.6	4.0	129.1	23.7	0.8	1003.3
Metribuzin	533.1	328.7	42.4	443.2	403.0	2.1	160.6	35.6	2.3	1950.9
Naptalam	-	-	-	8.1	3.0	-	-	-	-	11.1
Naptalam & Dinoseb	20.7	5.9	3.8	9.5	15.0	-	13.8	11.8	-	81.8
Oryzalin	2.1	0.7	-	0.7	0.8	-	2.3	a	-	7.4
Paraquat	2.1	9.2	3.5	4.1	14.3	-	2.3	1.8	-	37.2
Pendimethalin	32.1	15.1	-	2.0	9.0	a	a	-	-	59.5
Profluralin	12.4	-	-	6.1	-	-	a	-	-	18.6
Sethoxydin	-	a	-	a	-	-	a	-	-	a
Trifluralin	97.3	18.4	5.8	86.6	178.6	a	47.9	20.3	0.8	457.1
Vernolate	-	-	-	-	-	-	-	3.7	-	3.7
INSECTICIDES:										
Acephate	-	-	-	-	a	-	-	-	-	a
Carbaryl	10.4	5.8	-	14.0	22.3	1.8	20.4	12.8	-	86.6
Carbophenothion	-	-	-	a	-	-	-	-	-	a
Diazinon	2.2	0.8	-	3.3	-	-	-	-	-	11.2
Dimethoate	-	-	-	1.4	a	-	3.4	2.1	-	4.3
Fenvalerate	-	-	-	a	-	-	-	-	-	a
Lindane	2.2	1.5	0.6	1.2	-	-	2.7	-	-	15.6
Malathion	-	-	-	-	6.0	-	-	-	-	6.0
Parathion	-	-	-	-	0.9	-	-	-	-	0.9
Phorate	-	-	-	-	-	-	0.7	-	-	0.7
FUNGICIDES AND OTHER CONTROL:										
Captan	18.4	7.9	4.2	4.4	19.6	-	8.9	3.9	-	64.1
Carboxin	4.8	-	1.5	3.1	-	-	-	-	-	10.6
Paraquat (Defoliant)	2.1	1.1	a	2.7	6.0	a	1.3	1.2	-	15.0

* - Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - District data not published when less than 500 acres treated.

TABLE 30. WHEAT ACREAGES TREATED BY REGIONS AND PESTICIDE, OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	1,000 Acres									
HERBICIDES:										
2,4-D	23.0	8.8	3.2	7.8	3.8	a	4.7	2.8	a	67.2
Dicamba	3.8	2.6	1.3	4.2	1.6	-	-	1.3	a	19.0
Dinoseb	-	-	-	-	-	-	a	-	-	a
Glyphosate	1.0	a	-	1.6	a	a	1.8	-	-	4.6
MCPA	11.9	-	a	15.4	-	-	-	-	-	24.8
INSECTICIDES:										
Carbaryl	-	-	-	0.5	-	-	-	-	a	1.1
Lindane	-	-	-	-	-	-	-	-	a	a
Malathion	-	a	-	-	-	-	-	-	-	1.1
FUNGICIDES:										
Captan	10.9	-	-	0.6	-	-	-	-	a	8.6
Carboxin	25.1	6.3	2.5	3.4	-	-	-	-	-	32.8
Maneb	2.9	6.5	-	-	-	-	-	-	-	7.3

* - Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - District data not published when less than 500 acres treated.

TABLE 31. OATS ACREAGES TREATED BY REGIONS AND PESTICIDE, OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	1,000 Acres									
HERBICIDES:										
2,4-D	9.1	26.0	31.3	6.0	2.0	4.5	a	-	0.9	72.4
2,4-DB	a	1.7	1.0	-	-	0.8	-	-	-	3.2
Dicamba	0.5	4.3	8.0	1.8	2.1	1.4	-	-	a	19.0
Dinoseb	-	-	-	-	-	-	a	-	-	a
Glyphosate	-	-	a	-	-	-	-	-	-	a
MCPA	7.6	a	1.4	7.6	-	-	-	-	-	22.0
INSECTICIDES:										
Carbaryl	-	-	0.8	-	-	a	-	-	a	1.0
Dimethoate	a	-	-	-	-	-	-	-	-	a
Malathion	-	-	-	-	-	-	-	-	a	a
Toxaphene	-	-	-	-	-	-	-	-	a	a
FUNGICIDES:										
Captan	1.3	-	-	-	-	-	-	-	-	1.3
Carboxin	1.6	0.7	2.8	-	-	-	-	-	-	4.6

* - Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - District data not published when less than 500 acres treated.

TABLE 32. ALFALFA HAY ACREAGES TREATED BY REGIONS AND PESTICIDE, OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	1,000 Acres									
HERBICIDES:										
Benefin	-	0.7	-	-	-	-	0.8	-	-	1.6
2,4-DB	a	0.7	8.6	0.5	-	1.7	0.5	-	a	11.1
EPTC	5.5	0.8	2.2	1.4	a	1.0	a	-	-	11.0
Metribuzin	-	-	-	a	a	a	-	-	-	1.4
Profluralin	-	1.9	-	0.5	-	-	-	-	-	2.6
Pronamide	a	-	4.4	1.6	1.9	a	0.6	-	0.8	10.8
Simazine	-	2.6	4.6	4.0	1.1	0.7	0.8		-	14.0
INSECTICIDES:										
Azinphosmethyl	-	-	1.5	-	a	-	-	-	-	1.7
Carbaryl	4.0	7.8	6.8	8.0	4.6	8.6	4.1	0.5	a	47.4
Carbofuran	a	1.0	a	-	0.7	a	0.8	-	a	3.8
Diazinon/Methoxychlor	1.9	1.6	a	0.9	-	a	-	-	a	5.2
Dimethoate	16.7	21.4	37.7	15.1	6.0	24.3	0.9	-	4.1	124.9
Malathion	1.0	0.8	3.1	0.5	a	a	0.8	-	1.8	9.8
Malathion/Methoxychlor	-	3.4	4.5	0.5	-	0.7	1.0	-	a	9.6
Methidathion	-	6.1	4.8	3.3	6.8	3.1	0.6	-	1.5	27.4
Methomyl	-	-	-	a	-	-	-	-	-	a
Methoxychlor	a	a	1.1	6.0	2.2	-	5.2	-	3.4	22.5
Methyl Parathion	-	0.2	4.2	-	-	3.3	-	-	-	6.4
Parathion	-	0.8	14.4	-	-	1.7	-	-	a	13.6
Phosmet	-	-	-	-	-	a	-	-	a	0.8

* - Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - District data not published when less than 500 acres treated.

TABLE 33. OTHER HAY ACREAGES TREATED BY REGIONS AND PESTICIDE, OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	1,000 Acres									
HERBICIDES:										
2,4-D	-	a	0.9	-	0.8	-	-	2.0	2.2	6.5
2,4-DB	-	-	1.2	-	2.8	-	-	-	-	3.1
Dicamba	-	-	-	-	-	-	1.0	-	2.2	5.3
INSECTICIDES:										
Azinphosmethyl	-	-	a	-	-	-	-	-	-	a
Carbaryl	-	-	0.6	1.6	a	-	-	-	1.6	4.7
Dimethoate	-	-	3.6	-	0.6	1.6	-	-	-	3.9
Malathion	-	-	-	-	-	-	-	0.5	1.6	5.3
Parathion	-	-	3.7	-	-	0.6	-	-	-	1.9

* - Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - District data not published when less than 500 acres treated.

TABLE 34. PASTURE ACREAGES TREATED BY REGIONS AND PESTICIDE, OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	1,000 Acres									
HERBICIDES:										
2,4-D	-	4.5	3.8	6.6	11.3	-	2.1	7.6	a	41.8
Dicamba	1.7	-	a	5.6	a	a	1.6	-	a	14.8
Glyphosate	-	-	-	-	-	-	0.5	1.6	1.6	3.6
Paraquat	-	-	-	-	-	-	-	4.5	2.3	5.6
Picloram	-	3.4	7.0	1.4	12.4	23.8	3.4	15.6	40.1	108.0
INSECTICIDES:										
Parathion	-	-	0.5	-	-	-	-	-	-	0.5

* - Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - District data not published when less than 500 acres treated.

TABLE 35. TOBACCO ACREAGES TREATED BY REGIONS AND PESTICIDE, OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	1,000 Acres									
HERBICIDES:										
Benefin	-	-	-	-	-	-	a	2.2	-	2.4
Diphenamid	-	-	-	0.9	-	-	0.6	0.6	-	2.1
Isopropalin	-	-	-	-	-	-	-	a	-	a
Metolachlor	-	-	-	-	-	-	-	a	-	a
Pebulate	-	-	-	-	-	-	-	1.6	-	1.6
Pendimethalin	-	-	-	-	-	-	0.6	3.3	-	3.8
INSECTICIDES:										
Acephate	-	-	-	1.0	-	-	0.8	1.0	-	2.1
Carbaryl	-	-	-	-	-	-	0.6	1.3	-	1.7
Carbofuran	-	-	-	-	-	-	-	1.7	-	1.7
Diazinon	-	-	-	0.8	-	-	a	1.2	-	1.9
Dimethoate	-	-	-	-	-	-	-	a	-	a
Disulfoton	-	-	-	-	-	-	-	0.5	-	0.5
Malathion	-	-	-	-	-	-	-	0.5	-	0.5
FUNGICIDES:										
Metalaxyl	-	-	-	-	-	-	1.1	6.4	-	6.8
OTHER CONTROL:										
Maleic Hydrazide	-	-	-	0.4	-	-	1.5	5.5	-	7.3

* - Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - District data not published when less than 500 acres treated.

TABLE 36. PERCENT OF THE HERBICIDE, INSECTICIDE OR FUNGICIDE TREATED CORN ACREAGE IN EACH REGION TREATED WITH SPECIFIC PESTICIDE-OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	(PERCENT)									
HERBICIDES:										
2,4-D	25.8	9.6	3.5	15.3	11.8	6.7	3.4	6.2	10.9	12.6
Alachlor	39.4	53.3	23.5	47.2	34.4	15.1	32.6	33.0	34.5	38.0
Atrazine	63.9	83.3	92.6	82.6	80.7	93.1	90.8	90.8	80.9	81.5
Bentazon	0.5	0.2	0.1	a	0.1	0.2	b	b	b	0.2
Butylate	9.6	5.7	1.7	5.4	21.4	10.6	24.5	13.1	9.9	12.0
Cyanazine	37.1	34.2	16.4	30.6	22.3	19.7	16.8	24.7	13.8	26.7
Dicamba	25.8	14.2	4.8	27.8	23.0	11.7	5.1	5.1	15.7	18.2
EPTC	1.1	0.5	3.9	4.9	0.6	2.1	0.9	4.2	7.9	2.2
Glyphosate	0.8	0.2	0.6	0.2	0.1	5.2	0.5	0.1	6.6	0.7
Linuron	0.1	0.3	0.2	0.1	0.8	a	0.4	1.7	0.1	0.4
Metolachlor	24.6	26.7	54.7	32.0	24.8	32.0	27.4	16.7	26.3	28.8
Paraquat	0.6	7.4	10.3	2.4	7.2	19.5	4.3	7.7	15.3	5.9
Pendimethalin	0.6	0.3	b	0.2	b	b	b	b	b	0.2
Propachlor	b	b	b	b	0.4	b	b	b	b	0.1
Simazine	2.3	3.8	6.4	1.6	2.4	21.4	5.5	10.1	11.4	4.5
INSECTICIDES:										
Carbaryl	1.1	2.5	0.5	1.1	2.1	1.1	0.4	0.5	0.2	1.3
Carbofuran	24.7	28.8	27.4	24.3	22.1	35.0	16.8	44.6	33.7	25.8
Chlorpyrifos	0.3	13.8	15.1	6.1	10.5	9.2	7.2	5.4	b	7.7
Diazinon	3.4	6.1	1.9	1.1	1.0	1.8	0.1	0.9	0.8	2.1
Dimethoate	b	b	b	1.6	b	b	b	b	b	0.3
Disulfoton	b	b	0.5	0.2	b	b	b	b	b	0.1
Fonofos	33.8	26.2	20.6	41.7	30.0	26.4	40.0	14.8	9.3	31.0
Isofenphos	4.1	3.0	6.4	3.6	1.4	0.2	2.0	b	b	2.8
Lindane	5.7	9.5	7.4	1.0	5.3	9.1	4.0	17.8	3.0	6.0
Methiocarb	b	b	b	b	b	b	0.2	b	0.4	a
Methomyl	b	b	b	b	1.2	b	b	b	b	0.2
Oxydemetonmethyl	b	1.3	b	b	b	b	b	b	b	0.2
Phorate	1.7	b	3.0	2.8	0.8	2.5	2.9	b	13.0	2.0
Prophos	0.5	0.4	b	b	0.8	b	3.5	0.5	b	0.7
Terbufos	33.9	23.0	23.2	24.8	27.2	20.8	23.6	20.9	39.6	26.5
Toxaphene	0.3	3.3	1.1	1.2	4.8	5.2	0.6	b	1.0	2.1
Trichlorfon	b	b	0.5	b	b	b	b	b	b	a
FUNGICIDES:										
Captan	97.5	100.0	98.9	78.2	97.9	89.3	84.3	100.0	100.0	93.0
Mancozeb	5.0	b	b	b	b	b	62.7	b	b	7.5

* - See Table 20 for percent of Corn acreage in the region being treated for weed, insect or disease control. Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - Less than 0.1 percent.

b - None reported.

TABLE 37. PERCENT OF THE HERBICIDE, INSECTICIDE OR FUNGICIDE TREATED SOYBEAN ACREAGE IN EACH REGION TREATED WITH SPECIFIC PESTICIDE-OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	(PERCENT)									
HERBICIDES:										
2,4-DB	0.1	0.3	b	0.3	1.8	b	1.4	3.7	b	0.8
Actifluorfen	3.6	2.1	6.0	3.0	7.2	9.1	2.6	10.6	6.8	4.2
Alachlor	35.1	66.5	42.9	48.3	45.4	24.7	46.1	66.1	65.2	47.1
Bentazon	11.4	8.9	8.4	8.0	10.6	36.2	4.8	8.0	2.0	9.4
Bifenox	1.1	1.0	0.2	1.1	1.5	b	0.1	b	b	1.0
Chloramben	41.5	11.5	1.0	6.6	9.1	b	3.5	4.5	20.1	17.3
Chlorbromuron	b	a	b	b	b	b	b	b	b	a
Diclofop-Methyl	0.6	0.3	b	0.3	0.1	b	b	1.2	b	0.3
Dinoseb	b	b	b	0.2	b	b	0.5	b	b	0.1
Fluchloralin	0.9	b	b	1.5	2.1	b	0.2	4.4	b	1.1
Glyphosate	0.5	0.6	2.9	0.4	2.0	b	0.7	2.9	21.5	1.0
Linuron	8.4	39.4	60.6	24.1	28.4	11.9	43.5	61.4	40.3	27.5
Metolachlor	21.4	25.9	53.5	30.4	25.4	67.2	39.3	16.4	14.9	27.0
Metribuzin	51.5	50.1	38.8	65.5	53.7	34.9	48.9	24.2	41.4	52.5
Naptalam	a	a	b	1.2	0.4	b	b	b	b	0.3
Naptalam & Dinoseb	2.0	0.9	3.5	1.4	2.0	b	4.2	8.0	b	2.2
Oryzalin	0.2	0.1	b	0.1	0.1	b	0.7	a	b	0.2
Paraquat	0.2	1.4	3.2	0.6	1.9	b	0.7	1.2	b	1.0
Pendimethalin	3.1	2.3	b	0.3	1.2	0.9	0.1	b	b	1.6
Profluralin	1.2	b	b	0.9	b	b	0.1	b	b	0.5
Sethoxydin	a	a	b	a	b	b	b	0.8	b	a
Trifluralin	9.4	2.8	5.3	12.8	23.8	7.3	14.6	13.8	14.6	12.3
Vernolate	b	b	b	b	b	b	b	1.5	b	0.1
INSECTICIDES:										
Acephate	b	b	b	b	1.2	b	b	b	b	0.2
Carbaryl	70.5	79.2	b	68.6	70.4	100.0	66.4	85.6	b	69.8
Carbophenothion	b	b	b	1.9	b	b	b	b	b	0.3
Diazinon	14.7	11.3	b	16.1	b	b	b	b	b	9.0
Dimethoate	b	b	b	6.9	0.6	b	17.6	14.4	b	3.5
Fenvalerate	b	b	b	1.3	b	b	b	b	b	0.2
Lindane	14.7	20.8	100.0	6.1	b	b	8.9	b	b	12.6
Malathion	b	b	b	b	24.0	b	b	b	b	4.8
Parathion	b	b	b	b	3.7	b	b	b	b	0.7
Phorate	b	b	b	b	b	b	7.1	b	b	0.6
FUNGICIDES AND OTHER CONTROL:										
Captan	79.1	100.0	72.9	58.3	100.0	b	100.0	100.0	b	85.5
Carboxin	20.9	b	27.1	41.7	b	b	b	b	b	14.2
Paraquat (Defoliant)	100.0	55.2	100.0	100.0	100.0	100.0	100.0	100.0	b	92.0

* - See Table 21 for percent of soybean acreage in the region being treated for weed, insect or disease control. Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - Less than 0.1 percent.

b - None reported.

TABLE 38. PERCENT OF THE HERBICIDE, INSECTICIDE OR FUNGICIDE TREATED WHEAT ACREAGE IN EACH REGION TREATED WITH SPECIFIC PESTICIDE-OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	(PERCENT)									
HERBICIDES:										
2,4-D	62.6	79.6	70.9	19.0	69.2	77.3	82.8	100.0	100.0	62.2
Dicamba	10.1	23.2	29.1	10.3	28.8	b	b	46.1	100.0	17.6
Dinoseb	b	b	b	b	b	b	3.1	b	b	0.2
Glyphosate	2.6	2.3	b	3.8	1.9	22.7	31.7	b	b	4.3
MCPA	32.1	b	4.7	69.3	b	b	b	b	b	23.0
INSECTICIDES:										
Carbaryl	b	b	b	100.0	b	b	b	b	77.8	18.5
Lindane	b	b	b	b	b	b	b	b	22.2	0.2
Malathion	b	100.0	b	b	b	b	b	b	b	17.8
FUNGICIDES:										
Captan	27.2	b	b	14.4	b	b	b	b	100.0	12.3
Carboxin	62.7	43.6	100.0	85.6	b	b	b	b	b	46.9
Maneb	7.3	44.9	b	b	b	b	b	b	b	10.4

* - See Table 22 for percent of wheat acreage in the region being treated for weed, insect or disease control. Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - Less than 0.1 percent.

b - None reported.

TABLE 39. PERCENT OF THE HERBICIDE, INSECTICIDE OR FUNGICIDE TREATED OATS ACREAGE IN EACH REGION TREATED WITH SPECIFIC PESTICIDE-OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	(PERCENT)									
HERBICIDES:										
2,4-D	51.8	83.1	78.5	40.4	48.6	68.3	82.3	b	78.9	62.4
2,4-DB	1.6	5.4	2.6	b	b	12.1	b	b	b	2.8
Dicamba	3.0	13.6	20.1	11.8	51.4	21.9	b	b	29.8	16.4
Dinoseb	b	b	b	b	b	b	16.7	b	b	0.3
Glyphosate	b	b	0.2	b	b	b	b	b	b	a
MCPA	43.5	0.5	3.6	51.0	b	b	b	b	b	19.0
INSECTICIDES:										
Carbaryl	b	b	100.0	b	b	100.0	b	b	48.4	50.2
Dimethoate	100.0	b	b	b	b	b	b	b	b	21.2
Malathion	b	b	b	b	b	b	b	b	12.9	0.4
Toxaphene		b	b	b	b	b	b	b	38.7	1.1
FUNGICIDES:										
Captan	59.4	b	b	b	b	b	b	b	b	12.6
Carboxin	40.6	100.0	100.0	b	b	b	b	b	b	46.2

* - See Table 23 for percent of oats acreage in the region being treated for weed, insect or disease control. Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - Less than 0.1 percent.

b - None reported.

TABLE 40. PERCENT OF THE HERBICIDE, INSECTICIDE OR FUNGICIDE TREATED ALFALFA HAY ACREAGE IN EACH REGION TREATED WITH SPECIFIC PESTICIDE-OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	(PERCENT)									
HERBICIDES:										
Benefin	b	10.5	b	b	b	b	28.7	b	b	3.1
2,4-DB	2.7	10.5	43.6	5.6	b	45.5	16.4	b	26.5	21.0
EPTC	95.5	12.3	11.1	16.1	8.0	25.1	5.7	b	b	20.7
Metribuzin	b	b	b	3.2	6.7	9.8	b	b	b	2.7
Profluralin	b	28.1	b	6.0	b	b	b	b	b	5.0
Pronamide	1.8	b	22.4	18.1	53.4	7.2	20.5	b	88.2	20.3
Simazine	b	38.6	23.5	44.3	31.9	19.6	28.7	b	b	26.4
INSECTICIDES:										
Azinphosmethyl	b	b	2.8	b	2.6	b	b	b	b	0.9
Carbaryl	24.1	28.1	12.6	26.7	28.2	29.4	50.6	75.9	3.8	25.1
Carbofuran	0.5	3.7	0.6	b	4.6	1.4	10.1	b	1.4	2.0
Diazinon/Methoxychlor	11.3	5.8	0.8	2.9	b	0.5	b	b	3.1	2.8
Dimethoate	100.0	77.0	70.0	50.2	36.9	82.8	11.3	b	66.4	66.1
Malathion	6.0	2.9	5.8	1.5	2.1	1.5	10.1	24.1	29.8	5.2
Malathion/Methoxychlor	b	12.2	8.4	1.8	b	2.3	12.1	b	4.8	5.1
Methidathion	b	21.8	9.0	10.9	42.0	10.5	6.8	b	24.2	14.5
Methomyl	b	b	b	0.9	b	b	b	b	b	0.2
Methoxychlor	1.3	1.4	2.2	19.8	13.2	b	63.0	b	56.2	11.9
Methyl Parathion	b	0.7	7.8	b	b	11.2	b	b	b	3.4
Parathion	b	2.8	26.8	b	b	5.9	b	b	0.8	7.2
Phosmet	b	b	b	b	b	0.9	b	b	5.5	0.4

* - See Table 24 for percent of alfalfa hay acreage in the region being treated for weed, insect or disease control. Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - Less than 0.1 percent.

b - None reported.

TABLE 41. PERCENT OF THE HERBICIDE, INSECTICIDE OR FUNGICIDE TREATED OTHER HAY ACREAGE IN EACH REGION TREATED WITH SPECIFIC PESTICIDE-OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	(PERCENT)									
HERBICIDES:										
2,4-D	b	100.0	40.7	b	21.7	b	b	100.0	100.0	58.8
2,4-DB	b	b	59.3	b	78.3	b	b	b	b	18.9
Dicamba	b	b	b	b	b	b	100.0	b	100.0	48.6
INSECTICIDES:										
Azinphosmethyl	b	b	18.2	b	b	b	b	b	b	3.0
Carbaryl	b	b	9.5	100.0	36.8	b	b	b	100.0	33.6
Dimethoate	b	b	54.1	b	63.2	71.4	b	b	b	27.7
Malathion	b	b	b	b	b	b	b	100.0	100.0	38.1
Parathion	b	b	54.5	b	b	28.6	b	b	b	13.6

* - See Table 25 for percent of other hay acreage in the region being treated for weed, insect or disease control. Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - Less than 0.1 percent.

b - None reported.

TABLE 42. PERCENT OF THE HERBICIDE, INSECTICIDE OR FUNGICIDE TREATED PASTURE ACREAGE IN EACH REGION TREATED WITH SPECIFIC PESTICIDE-OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	(PERCENT)									
HERBICIDES:										
2,4-D	b	56.8	42.3	79.9	60.9	b	31.6	31.5	0.8	29.0
Dicamba	100.0	b	3.5	68.3	2.4	2.3	24.5	b	0.3	10.3
Glyphosate	b	b	b	b	b	b	8.2	6.7	3.7	2.5
Paraquat	b	b	b	b	b	b	b	18.4	5.3	3.9
Picloram	b	43.2	78.9	17.1	67.0	100.0	51.0	64.4	91.7	75.0
INSECTICIDES:										
Parathion	b	b	100.0	b	b	b	b	b	b	9.7

* - See Table 26 for percent of pasture acreage in the region being treated for weed, insect or disease control. Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - Less than 0.1 percent.

b - None reported.

TABLE 43. PERCENT OF THE HERBICIDE, INSECTICIDE OR FUNGICIDE TREATED TOBACCO ACREAGE IN EACH REGION TREATED WITH SPECIFIC PESTICIDE-OHIO 1982*

Pesticide	Northwest	North Central	Northeast	West Central	Central	East Central	Southwest	South Central	Southeast	Ohio
	(PERCENT)									
HERBICIDES:										
Benefin	b	b	b	b	b	b	15.7	26.8	b	23.0
Diphenamid	b	b	b	100.0	b	b	46.4	7.5	b	20.0
Isopropalin	b	b	b	b	b	b	b	1.4	b	1.1
Metolachlor	b	b	b	b	b	b	b	1.1	b	0.9
Pebulate	b	b	b	b	b	b	b	19.4	b	15.2
Pendimethalin	b	b	b	b	b	b	42.7	38.7	b	35.7
INSECTICIDES:										
Acephate	b	b	b	100.0	b	b	50.8	17.6	b	28.5
Carbaryl	b	b	b	b	b	b	38.3	23.7	b	23.4
Carbofuran	b	b	b	b	b	b	b	29.9	b	23.5
Diazinon	b	b	b	83.3	b	b	12.6	23.0	b	26.6
Dimethoate	b	b	b	b	b	b	b	0.1	b	0.1
Disulfoton	b	b	b	b	b	b	b	8.2	b	6.4
Malathion	b	b	b	b	b	b	b	8.2	b	6.4
FUNGICIDES:										
Metalaxyl	b	b	b	b	b	b	100.0	93.4	b	85.8
OTHER CONTROL:										
Maleic Hydrazide	b	b	b	100.0	b	b	100.0	88.4	b	90.2

* - See Table 27 for percent of tobacco acreage in the region being treated for weed, insect or disease control. Acres receiving more than one treatment are included only once. District acreages were computed using survey straight average percents while Ohio totals were weighed computations using district planted acreages as weights. Therefore, district averages may not add to the Ohio total.

a - Less than 0.1 percent.

b - None reported.

TABLE 44. PROCEDURES FOR PEST CONTROL USED BY FARMERS OF MAJOR FIELD CROPS IN OHIO - 1982

REGION & STATE	Percent of Sample Reporting	PERCENT OF FARMERS USING PEST CONTROL PRACTICE /a/						
		Crop Rotation	Resistant Variety	Biological Control	Cultivation	Organic Farming	Chemical Comtrol	No Control Practice
Northwest	97.2	94.7	86.5	6.9	88.2	6.9	98.4	0.0
North Central	97.7	92.9	88.2	10.6	63.5	4.7	96.5	0.0
Northeast	89.3	87.0	72.8	6.5	52.2	5.4	94.6	1.1
West Central	96.9	93.5	84.3	8.3	88.9	3.7	96.8	0.0
Central	98.0	89.5	81.2	7.1	69.5	3.8	97.5	0.0
East Central	98.1	83.2	71.6	10.3	34.8	9.0	94.2	1.9
Southwest	96.4	82.6	72.0	5.6	78.9	1.9	94.4	0.6
South Central	96.2	79.7	69.5	7.8	68.0	3.1	91.4	4.7
Southeast	91.9	77.4	68.6	13.1	36.5	5.8	97.1	1.5
State	96.2	87.6	78.2	8.2	68.2	4.9	96.0	0.9

/a/ Totals will equal more than 100 percent because farmers may use more than one practice in pest control.

TABLE 45. USE OF INTEGRATED PEST MANAGEMENT PROGRAMS BY FARMERS ON MAJOR FIELD CROPS IN OHIO - 1982.

REGION & STATE	TOTAL REPORTS IN SAMPLE	PERCENT OF FARMERS USING IPM PROGRAMS ON CROP /a/							
		TOTAL	CORN	SOYBEANS	WHEAT	OATS	ALFALFA HAY	OTHER HAY	TOBACCO
Northwest	252	15.5	12.2	11.6	3.2	3.2	4.6	0.0	b
North Central	87	20.7	19.8	11.1	7.0	3.0	14.1	0.0	b
Northeast	103	12.6	11.2	1.2	1.2	1.1	4.4	0.0	b
West Central	223	18.8	14.2	14.4	5.7	0.0	5.7	1.2	0.0
Central	244	14.3	12.8	10.7	3.4	1.1	4.2	0.5	0.0
East Central	158	7.6	7.8	0.8	0.0	0.0	2.2	0.0	b
Southwest	167	16.2	14.3	11.0	0.7	0.0	2.3	0.8	2.6
South Central	133	15.8	10.1	9.0	1.9	0.0	1.0	0.0	4.8
Southeast	149	8.7	8.2	0.8	0.0	0.0	2.3	0.8	b
State	1,516	15.9	12.1	8.9	2.6	0.9	4.2	0.4	1.5

/a/ Question answered by all survey respondents (1,516)
/b/ Crop not grown
/c/ Weighed computation

TABLE 46. SOURCE OF INTEGRATED PEST MANAGEMENT SERVICES TO FARMERS OF MAJOR FIELD CROPS IN OHIO - 1982.

REGION & STATE	PERCENT OF IPM SERVICES PROVIDED BY: /a/				
	Cooperative Extension Service	Commercial Consulting Service	Pesticide Dealers	Grower Cooperative	Others
Northwest	16.0	32.0	44.0	8.0	0.0
North Central	22.2	55.6	22.2	0.0	0.0
Northeast	71.4	0.0	28.6	0.0	0.0
West Central	6.3	31.3	56.3	3.1	3.1
Central	17.4	26.1	43.5	8.7	4.3
East Central	62.5	12.5	12.5	12.5	0.0
Southwest	55.6	22.2	16.7	0.0	5.6
South Central	33.3	0.0	50.0	8.3	8.3
Southeast	81.8	0.0	18.2	0.0	0.0
State	31.0	23.4	37.9	4.8	2.8

/a/ 145 of 1,516 responding in the survey sample answered this question

TABLE 47. MAJOR SOURCES OF PESTICIDE INFORMATION USED BY FARMERS OF MAJOR FIELD CROPS IN OHIO - 1982.

REGION & STATE	PERCENT OF FARMERS RELYING ON FACILITY AS MAJOR SOURCE OF INFORMATION /a/								
	Extension Service	Farm Supply Dealer	State Dept. of Agriculture	Media Adver-tisement	Chemical Company Sales Rep.	Commercial Pesticide Applicator	Crop Scouts and Consultants	Self & Past Experience	Other
Northwest	18.1	41.0	1.0	1.0	2.9	5.7	2.9	27.6	0.0
North Central	8.6	28.6	1.4	1.4	5.7	5.7	10.0	38.6	0.0
Northeast	14.3	28.6	1.3	2.6	5.2	6.5	2.6	39.0	0.0
West Central	16.5	37.9	2.7	0.5	2.2	2.7	3.3	34.1	0.0
Central	18.0	34.0	0.5	0.0	2.6	7.2	1.5	35.6	0.5
East Central	25.2	22.9	2.3	0.8	0.0	3.8	0.0	45.0	0.0
Southwest	14.4	30.3	2.3	0.0	3.8	6.8	1.5	40.9	0.0
South Central	24.0	26.0	2.1	1.0	4.2	1.0	0.0	41.7	0.0
Southeast	31.0	22.1	0.9	0.0	0.9	0.0	0.9	44.2	0.0
State	19.1	31.8	1.6	0.7	2.7	4.6	2.2	37.3	0.1

/a/ 1,205 of 1,516 responding in the survey sample answered the question.

TABLE 48. FARMERS, FAMILY MEMBERS AND FARM EMPLOYEES INVOLVED IN THE PROCESSES OF APPLYING PESTICIDES

REGION & STATE	Total Reports of Survey Question	Percent of Survey Sample Answering Question	FARM ASSOCIATED PERSONNEL INVOLVED WITH PESTICIDE PROCESS:								
			Mix, Load & Apply			Mix and Load Only			Apply Only		
			Reports (No.)	People (No.)	Involved (% of farms)	Reports (No.)	People (No.)	Involved (% of farms)	Reports (No.)	People (No.)	Involved (% of farms)
Northwest	188	74.6	183	293	97.3	9	13	4.8	15	18	8.0
North Central	70	80.5	70	99	100.0	2	3	2.9	3	3	4.3
Northeast	71	68.9	68	95	95.8	6	9	8.5	6	6	8.5
West Central	168	75.3	161	240	95.8	6	8	3.6	13	15	7.7
Central	190	77.9	188	297	98.9	12	16	6.3	8	9	4.2
East Central	133	84.2	128	192	96.2	9	15	6.8	7	12	5.3
Southwest	119	71.3	117	182	98.3	4	5	3.4	6	7	5.0
South Central	100	75.2	96	150	96.0	8	13	8.0	6	9	6.0
Southeast	121	81.2	118	174	97.5	9	14	7.4	14	18	11.6
State	1,160	76.5	1,129	1,722	97.3	65	96	5.6	78	97	6.7

/a/ 1,160 of the 1,516 responding in the survey sample answered the question.

TABLE 49. PERCENT OF FARMERS WHO ARE CERTIFIED PESTICIDE APPLICATORS.

REGION & STATE	Percent of Sample Reporting	Percent who are Certified Pesticide Applicators
Northwest	97.6	74.2
North Central	97.7	67.1
Northeast	94.2	59.8
West Central	98.2	70.3
Cental	97.5	71.4
East Central	100.0	74.7
Southwest	97.6	74.2
South Central	97.7	69.2
Southeast	96.0	81.1
State	97.6	72.2

TABLE 50. PESTICIDE STORAGE FACILITIES USED BY FARMERS OF MAJOR FIELD CROPS IN OHIO - 1983

REGION & STATE	Percent of Sample Reporting	STORAGE OF PESTICIDES /a/				
		Locked Storage Area	Building for Pesticides Only	Building with Equipment	Building with Feed	Other
Northwest	75.0	19.0	15.3	60.3	26.5	5.3
North Central	74.7	29.2	23.1	44.6	13.8	10.8
Northeast	68.0	21.4	22.9	61.4	12.9	7.1
West Central	75.3	21.4	22.6	51.8	18.5	10.7
Central	79.5	22.7	22.2	51.5	19.6	9.8
East Central	76.6	23.1	13.2	55.4	23.1	10.7
Southwest	78.4	17.6	26.7	46.6	19.1	13.0
South Central	75.9	27.7	18.8	40.6	24.8	10.9
Southeast	75.2	20.5	24.1	44.6	12.5	9.8
State	75.9	21.9	20.7	51.4	19.9	9.6

/a/ The total may exceed 100% because farmers might use more than one method of storage or a combination such as a locked area in a building housing equipment, etc.

TABLE 51. METHODS OF DISPOSING OF PESTICIDE CONTAINERS USED BY PRODUCERS OF MAJOR FIELD CROPS IN OHIO - 1982

REGION & STATE	Percent of Sample Reporting	PERCENT OF FARMERS REPORTING METHOD OF DISPOSAL /a/							
		Burned on Farm	Buried on Farm	Triple Rinsed	Stored on Farm	Used for Other Purposes	Approved Disposal Site	Returned to Dealer	Other
Northwest	80.6	60.1	2.5	57.1	9.9	8.4	54.7	9.9	9.4
North Central	79.3	50.7	7.2	65.2	4.3	1.4	62.3	17.4	13.0
Northeast	73.8	52.6	15.8	67.1	10.5	9.2	34.2	10.5	5.3
West Central	79.4	53.1	14.1	64.4	6.8	6.2	47.2	16.4	10.2
Central	83.2	58.6	9.9	64.5	8.9	7.4	37.4	15.8	15.3
East Central	84.2	56.4	21.1	57.9	3.8	5.3	25.6	0.8	9.0
Southwest	80.8	47.4	7.4	57.8	8.1	7.4	40.0	6.7	20.0
South Central	79.7	47.2	22.6	50.0	5.7	0.9	43.4	2.8	1.9
Southeast	83.2	53.2	26.6	55.6	8.1	1.6	25.0	2.4	7.3
State	80.9	54.2	13.2	59.9	7.6	5.8	41.2	9.5	10.7

/a/ Percent totals may equal more than 100% because farmers may report more than one method of disposal.

TABLE 52. PROTECTIVE CLOTHING AND EQUIPMENT USE BY FARMERS IN OHIO FOR MIXING/LOADING OPERATIONS OF SELECTED PESTICIDES

PESTICIDE	PERCENT OF FARMERS USING ITEMS OF PROTECTIVE CLOTHING AND EQUIPMENT											Reports (No.)
	Gloves	Long Sleeved Shirt	Head Covering	Spray Suit, Coveralls	Rubber Boots	Dust Mask	Face Shield, Goggles	Respirator	Self Contained Breathing Apparatus	Closed Delivery System	None	
A. Restricted Use Pesticides												
Carbofuran	79	79	88	25	22	15	26	14	0	2	3	155
Fonofos	75	78	84	15	14	16	33	5	0	7	1	106
Parathion (Ethyl & Methyl); Disulfoton; Methidathion /1/	83	74	87	30	26	22	35	35	0	0	4	23
Toxaphene	86	95	90	14	24	29	38	33	0	10	0	21
Diclofop-Methyl; Pronamide /1/	69	85	77	15	31	23	54	15	0	0	0	13
Napalam & Dinoseb	59	67	81	22	15	22	30	19	0	7	7	27
Paraquat	85	82	90	23	27	19	36	16	0	4	3	160
Picloram	80	87	100	20	47	7	33	0	0	0	0	15
Total for Category /2/	80	80	88	22	23	18	33	15	0	4	2	524
B. Highly Toxic Pesticides-Not Restricted												
Isofenfos	92	100	85	15	23	23	38	23	0	8	0	13
Phorate; Prophos /1/	80	80	90	20	10	20	60	0	10	0	0	10
Terbufos	82	81	86	14	15	12	28	10	0	5	3	131
Total for A & B /3/	81	81	88	20	20	16	32	13	0.5	4	2	632
C. Moderately Toxic Pesticides												
Chlorpyrifos	79	79	85	21	12	24	47	9	0	6	3	34
Diazinon	88	94	88	12	18	29	47	29	0	0	0	17
Dimethoate	73	82	86	16	34	18	30	11	2	5	5	44
Lindane	65	74	94	15	12	21	29	15	0	0	3	34
Cyanazine	80	83	87	19	16	14	32	7	<1	5	7	294
2,4-D	76	79	83	16	17	12	31	9	<1	4	5	228
Dicamba	77	73	85	17	11	14	31	4	<1	5	3	215
Metolachlor	78	78	83	17	17	12	28	9	0	3	3	324
Metalaxyl	76	88	88	12	15	18	24	18	0	0	6	34
Total for Category /4/	78	79	85	17	16	14	31	9	<1	3	3	1227
D. Slightly Toxic Pesticides												
Acephate; Malathion /1/	63	82	91	9	18	18	18	0	0	0	0	11
Carbaryl	71	71	86	11	14	13	38	11	0	4	2	56
Alachlor	77	79	85	19	16	14	33	8	<1	3	3	531
Atrazine	77	78	85	19	19	12	28	9	<1	4	3	767
Glyphosate	74	81	94	13	26	21	26	9	2	4	2	47
Metribuzin	79	79	86	17	11	14	32	8	0	5	3	326
Trifluralin	77	75	81	13	6	13	29	5	0	8	4	77
Captan	66	75	98	20	23	18	27	14	2	2	2	44
Maleic Hydrazide	75	84	84	13	6	13	31	16	0	0	6	32
Total for Category /5/	77	78	85	18	16	13	30	9	<1	4	3	1895
Total for all Categories	78	79	86	18	16	14	31	9	<1	4	3	4678

/1/ Data for pesticides of similar toxicity and/or somewhat similar chemical structure combined in order to obtain sample size large enough for comparative purposes.
/2/ Includes data from 1 report each for fervalerate, methiocarb, methomyl and dinoseb.
/3/ Includes data from 1 report each for carbophenothion and oxydemetonmethyl plus those in /1/.
/4/ Includes data from 3 reports for phosmet.
/5/ Includes data from 4 reports for oryzalin.

TABLE 53. PROTECTIVE CLOTHING AND EQUIPMENT USED BY FARMERS IN OHIO FOR APPLYING SELECTED PESTICIDES

PESTICIDE	PERCENT OF FARMERS USING ITEMS OF PROTECTIVE CLOTHING AND EQUIPMENT											Reports (No.)
	Gloves	Long Sleeved Shirt	Head Covering	Spray Suit, Coveralls	Rubber Boots	Dust Mask	Face Shield, Goggles	Respirator	Self Contained Breathing Apparatus	Enclosed Tractor Cab	None	
A. Restricted Use Pesticides												
Carbofuran	45	70	77	23	19	15	13	12	0	23	14	155
Fonofos	22	58	66	15	8	8	12	4	0	36	11	106
Parathions (Ethyl & Methyl) Disulfoton; Methidathion /1/	83	74	87	39	26	22	22	35	0	17	4	23
Toxaphene	43	81	81	10	29	14	14	24	0	14	0	21
Diclofop-Methyl; Pronamide /1/	23	77	69	15	23	23	31	15	0	38	15	13
Napalam & Dinoseb	26	74	81	19	19	22	19	26	0	7	7	27
Paraquat	45	71	80	24	24	13	18	13	0	22	9	160
Picloram	53	93	100	20	47	7	33	0	0	13	0	15
Total for Category /2/	40	69	77	21	20	14	16	12	0	24	10	524
B. Highly Toxic Pesticides-Not Restricted												
Isofenfos	23	54	69	8	15	15	8	15	0	46	8	13
Phorate; Prophos /1/	30	40	60	10	0	10	20	0	10	40	10	10
Terbufos	34	66	73	13	11	5	9	6	0	27	15	131
Total for A & B /3/	38	67	75	19	17	11	14	10	0.5	26	11	632
C. Moderately Toxic Pesticides												
Chlorpyrifos	32	59	68	18	9	15	12	3	0	38	21	34
Diazinon	47	76	76	18	24	29	35	18	0	18	18	17
Dimethoate	45	61	77	16	32	16	20	16	2	14	9	44
Lindane	29	62	85	15	9	18	15	12	0	9	12	34
Cyanazine	36	69	76	19	12	9	14	6	1	24	14	294
2,4-D	36	69	75	16	15	10	15	11	<1	16	13	228
Dicamba	28	60	72	16	8	8	11	4	1	26	14	215
Metolachlor	34	63	69	15	14	7	11	6	0	25	13	324
Metalaxyl	44	88	85	12	9	21	21	18	0	3	9	34
Total for Category /4/	35	66	74	16	13	10	14	8	<1	22	13	1210
D. Slightly Toxic Pesticides												
Acephate; Malathion /1/	27	73	91	27	9	27	9	9	0	27	0	11
Carbaryl	27	59	73	11	13	7	9	13	0	27	9	56
Alachlor	39	68	76	20	12	10	16	8	<1	19	12	531
Atrazine	37	65	74	18	14	9	13	8	<1	22	13	767
Glyphosate	36	72	87	19	23	15	21	11	2	23	6	47
Metribuzin	36	66	73	15	7	9	14	5	1	27	13	326
Trifluralin	25	60	64	9	1	8	8	5	1	40	14	77
Captan	30	66	89	18	16	20	18	11	2	9	11	44
Maleic Hydrazide	50	91	84	9	3	16	22	16	0	3	6	32
Total for Category /5/	36	67	75	17	12	10	14	8	<1	22	12	1895
Total for all Categories	35	66	75	17	13	10	14	8	1	24	12	4678

/1/ Data for pesticides of similar toxicity and/or somewhat similar chemical structure combined in order to make sample size larger enough for comparative purposes.
/2/ Includes Fenvalerate, Methiocarb, Methomyl and Dinoseb with 1 report each.
/3/ Includes Carbophenothion and Oxydemeton methyl with 1 report each.
/4/ Includes data from 3 reports for phosmet.
/5/ Includes data from 4 reports for oryzalin.

TABLE 54. COMPARISON OF FARMER USE OF PROTECTIVE CLOTHING AND EQUIPMENT RELATED TO THE TOXICITY OF PESTICIDES OF THE SAME CHEMICAL GROUPING AND/OR CROPPING PRACTICE

PESTICIDE	PERCENT OF FARMERS USING ITEMS OF PROTECTIVE CLOTHING AND EQUIPMENT										
	Gloves	Long Sleeved Shirt	Head Covering	Spray Suit, Coveralls	Rubber Boots	Dust Mask	Face Shield, Goggles	Respirator	Closed Delivery System	Enclosed Tractor Cab	None
A. Corn & Soybean - Vegetation & Weed Control											
Mixer Loader:											
Paraquat /1/	85	82	90	23	27	19	36	16	4	-	3
Metolachlor /2/	78	78	83	17	17	12	28	9	3	-	3
Alachlor /3/	77	79	85	19	16	14	33	8	3	-	3
Applicator:											
Paraquat /1/	45	71	80	24	24	13	18	13	-	22	9
Metolachlor /2/	34	63	69	15	14	7	11	6	-	25	13
Alachlor /3/	39	68	76	20	12	10	16	8	-	19	12
B. Corn Production - Carbamate Insecticide											
Mixer Loader:											
Carbofuran /1/	79	79	88	25	22	15	26	14	2	-	3
Carbaryl /3/	71	71	86	11	14	13	38	11	4	-	2
Applicator:											
Carbofuran /1/	45	70	77	23	19	15	13	12	-	23	14
Carbaryl /2/	27	59	73	11	13	7	9	13	-	27	9
C. Corn Production - Soil Insect Control											
Mixer Loader:											
Fonofos /1/	75	78	84	15	14	16	33	5	7	-	1
Chlorpyrifos /2/	79	79	85	21	12	24	47	9	6	-	3
Applicator:											
Fonofos /1/	22	58	66	15	8	8	12	4	-	36	11
Chlorpyrifos /2/	32	59	68	18	9	15	12	3	-	38	21
D. Alfalfa Production - Insect Control											
Mixer Loader:											
Parathions /1/	83	74	87	30	26	22	35	35	0	-	4
Dimethoate /2/	73	82	86	16	34	18	30	11	5	-	5
Malathion /3/	63	82	91	9	18	18	18	0	0	-	0
Applicator:											
Parathion /1/	83	74	87	39	26	22	22	35	-	17	4
Dimethoate /2/	45	61	77	16	32	16	20	16	-	14	9
Malathion /3/	27	73	91	27	9	27	9	9	-	27	0

/1/ Highly toxic pesticide category.
/2/ Moderately toxic pesticide category.
/3/ Slightly toxic pesticide category.

OHIO CROP REPORTING SERVICE

Room 608 Federal Bldg
200 North High St.
Columbus, Ohio 43215

Phone (614) 469-5590

Cooperative Extention Service
The Ohio State University

1982 OHIO PESTICIDE USE SURVEY

Dear Reporter:

The use of pesticides is of major importance in modern agriculture and it is essential that those which are necessary for most effective crop production continue to be available when and where needed. This can be done only by providing information in defense of their use. This survey will help provide such answers by indicating which pesticides are used; on what crops, and in what quantities as well as procedures of application.

A similar survey was conducted in 1978 and was highly successful. The 1982 survey will identify any major changes since that earlier survey.

Your cooperation by answering the following questions is important in measuring the importance of pesticides to agriculture in Ohio. Your reply is kept confidential and used only to obtain area, State, or regional totals.

Respectfully,

Homer L. Carter
Agricultural Statistician in Charge

Ted L. Jones, Assistant Director,
Agricultural Industry

1. REPORT FOR THE FARM YOU OPERATE (Include land rented from others)

1982 CROP 00	Total Acres Planted	How Many Acres Were Treated For *			
		Weed Control (Herbicides)	Insect/Nematode Control (Insecticides)	Disease Control (Fungicides)	Other Control (Defoliants; desiccants, regulators, rodent, etc.)
Field Corn	101	102	103	104	105
Soybeans	111	112	113	114	115
Wheat	121	122	123	124	125
Oats	131	132	133	134	135
Alfalfa Hay	141	142	143	144	145
Other Hay	151	152	153	154	155
Tobacco	161	162	163	164	165
Pasture	171	172	173	174	175
Other Crops (Specify)_____	181	182	183	184	185
Total Acres of All Land Not Reported Above	191				
TOTAL ACRES OPERATED	199				

* Exclude seed already treated when purchased.

2. WHAT METHOD OF LAND PREPARATION WAS USED FOR THE FOLLOWING CROPS?

CROP PLANTED 00 (For Harvest in 1982)	No-till (acres)	Minimum or Reduced till (acres)	Conventional Till (acres)
Field Corn	201	202	203
Soybeans	211	212	213
Wheat	221	222	223
Oats	231	232	233

Definitions

No-till - no breaking of soil except where seed is planted.

Minimum or Reduced Till-breaking of soil with NO turning of soil.

Conventional till-turning of soil.

3. PESTICIDE USAGE

On the reverse side of this questionnaire, please report the pesticides used on each crop listed and grown by you for harvest in 1982. The following instructions apply:

a) Please refer to the enclosed list for name of pesticides used and reasons for treatments.
b) If more than one rate of application was used for a chemical, report each rate on a separate line.
c) If some acreage received more treatments than others, report additional applications on a separate line.
d) If two or more chemicals were applied in combination (during one application), report each chemical on a separate line

PESTICIDES USED ON EACH CROP (See instructions on preceding page.)

PESTICIDE USED in 1982 (List chemical or common name. See enclosed reference sheet)		Concentration or Formulation*	Quantity of Undiluted Product used per acre Each Application					Acres Treated	Number of Applications	Applicator		Method of Application Type of Coverage								Specify Target (Use codes on enclosed sheet to identify major reason for pesticide usage. Use maximum of 2 codes per chemical)		
												Aerial		Ground								
			Wetable Powder	Granular	Liquid	Other				Self	Commercial	Plane	Helicop.	Broadcast Incorp.	Broadcast Not Inc.	Band	In Furrow with seed	Spot			
LIST			lbs	lbs	qts.	specify		Acres	No.	(✓)		(✓)			(✓)				List Codes		
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*
Example: Aatrex		80%	1½					50	1	✓				✓					103, 116		
01 CORN - HERBICIDES							(1)	(2)	(3)	(4)					(5)					(6)	(7)
01 CORN - INSECTICIDES																					
01 CORN - OTHER CHEMICALS																					
02 SOYBEANS - HERBICIDES							(1)	(2)	(3)	(4)					(5)					(6)	(7)
02 SOYBEANS - INSECTICIDES																					
02 SOYBEANS - OTHER CHEMICALS																					
03 WHEAT - INSECTICIDES, HERBICIDES, AND OTHER CHEMICALS							(1)	(2)	(3)	(4)					(5)					(6)	(7)
04 OATS - INSECTICIDES, HERBICIDES, AND OTHER CHEMICALS																					
05 ALFALFA HAY - INSECTICIDES, HERBICIDES, AND OTHER CHEMICALS																					
06 OTHER HAY - INSECTICIDES, HERBICIDES, AND OTHER CHEMICALS																					
07 PASTURE - INSECTICIDES, HERBICIDES, AND OTHER CHEMICALS																					
08 TOBACCO - INSECTICIDES, HERBICIDES, AND OTHER CHEMICALS																					

* Formulation or concentration of active ingredient as shown on product label. Example: Astrex 80Wor4L. See enclosed list of commonly used pesticides.

OHIO CROP REPORTING SERVICE
Room 608 Federal Bldg
200 North High St
Columbus, Ohio 43215
Phone (614) 469-5590

OHIO PESTICIDE SURVEY

Cooperative Extension Service
The Ohio State University

Dear Reporter:

Your response to an earlier questionnaire on pesticide usage by crop is greatly appreciated. Results of that survey will be sent to you. This questionnaire is the final phase of the 1982 Pesticide Use Survey and is being sent to a small sample of earlier respondents. This questionnaire will provide some insight on sources of pesticide information, precautionary practices and other pesticide areas.

Your reply will be kept confidential and used only to obtain area and State totals.

Respectfully,

Homer Carter
Agricultural Statistician
In Charge

Ted. E. Jones
Assistant Director
Agri. Industry

---

1. During 1982 did you or your farming operation use an Integrated Pest Management program (IPM) where someone else made insect counts or identified weed, disease or nematode problems for the crops listed below?

101	CROP (✓) Yes	No	
Corn	☐	☐	102
Soybeans	☐	☐	103
Wheat	☐	☐	104
Oats	☐	☐	105
Alfalfa hay	☐	☐	106
Other hay	☐	☐	107
Tobacco	☐	☐	108

If yes for any crop, who provided the IPM service? 109

- ☐ Extension Service
- ☐ Commercial Consulting Service
- ☐ Pesticide Dealers
- ☐ Grower Cooperative
- ☐ Other _____ (Specify)

2. Upon whom did you rely as the one major source of pesticide (herbicides, insecticides, etc.) information in your farming operation during 1982? (Check only one.) 201

- ☐ Cooperative Extension Service
- ☐ Farm Supply Dealer
- ☐ State Department of Agriculture
- ☐ Media Advertisements
- ☐ Chemical Company Sales Representatives
- ☐ Commercial Pesticide Applicators
- ☐ Farm Crop Scouts and Consultants
- ☐ Yourself and past experiences
- ☐ Other _____ (Specify)

3. During 1982 how many people (counting yourself, family help or employees) were involved in: 301

a) Both mixing/loading and applying pesticides 302

b) Only mixing/loading pesticides. (Exclude persons reported in "a") 303

c) Only applying pesticides. (Exclude persons reported in "a" or "b") 304

d) If none; all custom applied, check here. ☐

4. Are you, any family members or any employees on your farm a certified applicator (that is, holder of a certified permit)? 701

☐ Yes ☐ No

(over)

5. Were any of the following protective clothing or equipment used by you, family help or farm employees while handling or applying pesticides in 1982?

(Check (✓) as many as apply) 401

	Used during Mixing/loading (✓)	Used during Spraying (✓)
a) Gloves	402	403
b) Long sleeve shirt	404	405
c) Head covering (cap, hat, etc.)	406	407
d) Spray suit, coveralls	408	409
e) Rubber boots	410	411
f) Dust mask	412	413
g) Face shield or goggles	414	415
h) Respirator	416	417
i) Self-contained breathing apparatus	418	419
j) Closed delivery system	420	
k) Enclosed tractor cab		423
l) None of the above	424	425

6. How do you store pesticides? (Check (✓) as many as apply) 501

a) In a locked storage area 502

b) In a building used only for pesticides 503

c) In a building with other materials:

(1) With equipment 504

(2) With feed, seed, fertilizer, etc. 505

d) Other (specify) _____ 506

7. What was done with empty pesticide containers? (Check (✓) as many as apply) 601

a) Burned on farm 602

b) Buried on farm 603

c) Triple rinsed before disposal.. 604

d) Stored on farm 605

e) Used for other purposes 606

f) Sent to sanitary landfill or approved disposal site 607

g) Returned to dealer 608

h) Other (junk, salvage, etc.) 609

8. What percentage of your seed was treated? 801

CROP	Before purchase Percent	Treated on farm Percent
Corn	802	803
Soybeans	804	805
Wheat	806	807
Oats	808	809

9. Which, if any, of the following practices do you employ? (Check (✓) as many as apply.) 901

	Yes	No	
a) Crop rotation	☐	☐	902
b) Resistant or tolerant variety	☐	☐	903
c) Biological control with predators, and/or parasites	☐	☐	904
d) Cultivation for weed control	☐	☐	905
e) Organic farming	☐	☐	906
f) Chemical control (herbicides, insecticides, fungicides, etc.)	☐	☐	907
g) None of the above	☐		908

WEED PROBLEMS COMMON TO OHIO'S MAJOR CROPS

Code		Code		Code	
101	Barnyardgrass	111	Foxtails	121	Smartweed
102	Bindweed	112	Giant Ragweed	122	Tall Ironweed
103	Canada Thistle	113	Jimsonweed	123	Velvet Leaf
104	Chickweed	114	Johnsongrass	124	Wild Cucumber
105	Climbing Milkweed	115	Lambsquarter	125	Wild Garlic/Onion
106	Crabgrass	116	Morning Glory	126	Wild Mustard
107	Cocklebur	117	Multiflora Rose	127	Yellow Nutsedge
108	Common Ragweed	118	Peppergrass	128	Yellow Rocket
109	Dandelion	119	Pigweed	129	Gen. Broadleaf Weed Prevention
110	Fall Panicum	120	Quackgrass	130	Gen. Grass Weed Prevention
		132	Artichoke	131	Nightshade

INSECT AND NEMATODE PROBLEMS IN OHIO'S MAJOR CROPS

	CORN		SOYBEANS		GRAINS
201	Armyworm	230	Bean Leaf Beetle	260	Armyworm
202	Chinch Bugs	231	Grasshopper	261	Cereal Leaf Beetle
203	Common Stalk Borer	232	Green Cloverworm	262	Grasshopper
204	Corn Leaf Aphid	233	Japanese Beetle	263	Greenbugs
205	Corn Rootworm	234	Mexican Bean Beetle	264	Hessian Fly
206	Cutworms	235	Nematodes	265	Nematodes
207	European Corn Borer	236	Seed Corn Maggot	266	Slugs
208	Fall Armyworm	237	Southern Green Stinkbug	267	Wheat Stem Sawfly
209	Flea Beetles	238	Spider Mites		
210	Japanese Beetle	239	Symphylan		ALFALFA & OTHER HAY & PASTURES
211	Nematodes				
212	Seed Corn Beetle		TOBACCO		
213	Seed Corn Maggot			280	Alfalfa Blotch Leafminer
214	Slugs	250	Budworm	281	Alfalfa Weevil
215	Sod Webworms	251	Cutworm	282	Aphids
216	Symphylan	252	Flea Beetle	283	Grasshopper
217	White Grubs	253	Hornworm	284	Potato Leafhopper
218	Wireworms	254	Nematodes	285	Spittlebug
		255	Wireworm		

DISEASE PROBLEMS IN OHIO'S MAJOR CROPS

	CORN		GRAINS
301	Anthracnose Stalk Rot	320	Barley Yellow Dwarf
302	Bacterial Leaf Blight	321	Crown and Root Rot
303	Gibberella Ear Rot	322	Leaf Rust
304	Gibberella Stalk Rot	323	Loose Smut
305	Maize Chlorotic Dwarf	324	Powdery Mildew
306	Maize Dwarf Mosaic	325	Scab
307	Northern Corn Blight	326	Soil Borne Mosaic
		327	Spindle Streak Mosaic
	SOYBEANS	328	Stinking Smut or Bunt
		329	Wheat Streak Mosaic
310	Bacterial Leaf Blight		
311	Downy Mildew		ALFALFA
312	Fusarium Stem and Root Rot		
313	Phytophthora Stem and Root Rot	340	Anthracnose Root Rot
314	Pythium Stem and Root Rot	341	Foliage Disease
315	Rhizoctonia Stem and Root Rot	342	Phytophthora Root Rot
316	Seed Decay and Mold	343	Sclerotinia Crown and Root Rot
317	Septoria Brown Spot		

LIST OF PESTICIDES COMMONLY USED IN OHIO

COMMON NAME	FORMULATIONS	TRADE NAME	SOME FORMULATIONS USED ON					
			Corn	Soybeans	Grains	Alfalfa	Other Hay	Tobacco
A. Insecticides (& Some Nematocides)								
Acephate	75S	Orthene		✓				✓
Azinphosmethyl	2S 2L, 50WP, 3D	Guthion		✓	✓	✓	✓	✓
Carbaryl	80S, 50WP	Sevin/Savit	✓	✓	✓	✓	✓	✓
Carbofuran	4F, 10G	Furadan	✓			✓		✓
Carbophenothion	4E, 8E	Trithion		✓		✓	✓	
Chlorpyrifos	10G, 15G	Lorsban	✓					
Demeton	2E, 6E	Systox			✓			
Diazinon	4E, 15G, 50W	Diazinon	✓	✓		✓		✓
Diazinon and Methoxychlor	2, 1EC	Alfa tox				✓	✓	
Dimethoate	4EC	Cygon/Defend	✓	✓	✓	✓	✓	✓
Disulfoton	15G, LC, 8E	Di-Syston	✓	✓	✓	✓	✓	✓
Endosulfan	2EC, 3EC, 50WP	Thiodan			✓	✓		✓
Endrin	1 6EC	Endrin			✓			
EPN	3E, 4E, 5E, 2G, 4G	EPN	✓	✓				
Ethion	8E, 4E	Aqua 8	✓					
Fensulfothion	15G, SC	Dasanit	✓	✓				✓
Fenvalerate	2 4EC	Pydrin		✓				
Fonofos	4E, 4EC 10G, 20G	Dyfonate	✓					✓
Isofenphos	20G, 6E	Amaze	✓					
Malathion	25WP, 57EC, 4D, 5D ULV	Cythion/Malathion	✓	✓	✓	✓	✓	✓
Malathion and Methoxychlor	2, 2EC	M&M					✓	
Methidathion	2E	Supracide				✓	✓	✓
Methiocarb	50%	Mesurol	✓	✓	✓	✓		✓
Methomyl	90WP, 1 8LC	Lannate/Nudrin	✓	✓	✓	✓		✓
Methoxychlor	50WP, 2E	Marlate/Methoxychlor	✓	✓		✓	✓	
Methyl Parathion	2MF, 4E, 2 8E	PenncapM/Methyl Parathion/Barricade	✓	✓		✓		
Mevinphos	4EC, 10 3WS	Phosdrin	✓			✓	✓	
Monocrotophos	5	Azodrin						✓
Naled	4D, 8E	Dibrom					✓	
Oxamyl	2SL	Vydate L						✓
Oxydemetonmethyl	SC	Meta Systox R	✓					
Parathion	15%4E, 8E, 2D	Niran/Aqua 8/Parathion	✓	✓	✓	✓		✓
Phenamiphos	15G 3E	Nemacur		✓				
Phorate	15G, 20G	Thimet	✓	✓	✓			
Phosmet	50WP	Imidan	✓			✓		
Prophos	10G	Mocap	✓					
Terbufos	15G	Counter	✓					
Toxaphene	6EC, 8E	Toxaphene	✓	✓	✓			
Trichlorfon	LS, 80SP, 5B	Dylox/Proxol	✓		✓	✓	✓	✓
B Herbicides								
Actifluorfen	2S	Blazer		✓				
Alachlor	4EC	Lasso	✓	✓				
Ametryne	80W	Evik	✓					
Atrazine	4E 80W, 20G, 4LC	Aatrex/Atrazine	✓					
Benefin	1 5EC, 2.5G	Balan				✓		✓
Bentazon	4EC	Basagran	✓	✓				
Bromoxynil	2E	Brominal			✓			
Butylate	6 7EC, 10G	Sutan +	✓					
Chloramben	2EC	Amiben		✓				
Chlorbromuron	50WP	Maloran		✓				
Cyanazine	80W, 4L	Bladex	✓					

COMMON NAME	FORMULATIONS	TRADE NAME	SOME FORMULATIONS USED ON					
			Corn	Soybeans	Grains	Alfalfa	Other Hay	Tobacco
Herbicides (continued)								
2,4-D	Many	Many	✓		✓		✓	
2,4-DB	2EC 200	Butoxone/Butyrac		✓	✓	✓	✓	
Dicamba	4EC,2EC	Banvel	✓		✓		✓	
Dinitramine	2EC, 10G	Cobex		✓				
Dinoseb	3EC	Dinitro/Premerge		✓	✓	✓		
Diphenamid	50W	Enide						✓
Diuron	80W	Karmex	✓		✓	✓		
EPTC	7EC 6 7EC	Eptam/Eradicane	✓			✓		
Fluchloralin	4EC	Basalin		✓				
Glyphosate	3WS	Roundup	✓	✓	✓			
Linuron	50WP	Lorox	✓	✓	✓			
MCPA	4EC	Bronate/MCPA			✓	✓	✓	
Metolachlor	6EC	Dual	✓	✓				
Metribuzin	50WP, 4F, 75DF	Sencor/Lexone		✓	✓	✓		
Naptalam and Dinoseb	2E/1E	Dyanap		✓				
Paraquat	2WS	Paraquat CL	✓					
Pebulate	6E, 10G	Tillam						✓
Pendimethalin	4EC	Prowl	✓	✓				
Profluralin	4EC	Tolban		✓		✓		
Pronamide	50W	Kerb				✓		
Propachlor	65WP 20G	Ramrod/Bexton	✓					
Simazine	80W, 4G	Princep	✓			✓		
Terbacil	80W	Sinbar				✓		
Trifluralin	4EC	Treflan		✓				
Vernolate	7E, 10G	Vernam		✓				
C Fungicides								
Aniyaline	50WP	Dyrene						✓
Benomyl	50WP	Benlate		✓				
Captan	Moly, 25	Captan	✓	✓	✓			
Chloroneb	65W	Demosan		✓				
EBDC Mixture	80WP	Polyram						✓
Fenaminosulf	70WP	Lesan	✓					
Mancozeb	80	Manzate200/ Dithane M-45	✓		✓			✓
Maneb	80	Manzate0/ Dithane 22			✓			✓
Metalaxyl	2E	Ridomil						✓
Zineb	75WP	Dithane Z 78/ Zineb			✓			✓
D Growth Regulator								
Maleic Hydrazide	30EC, 58%	MH-30						✓